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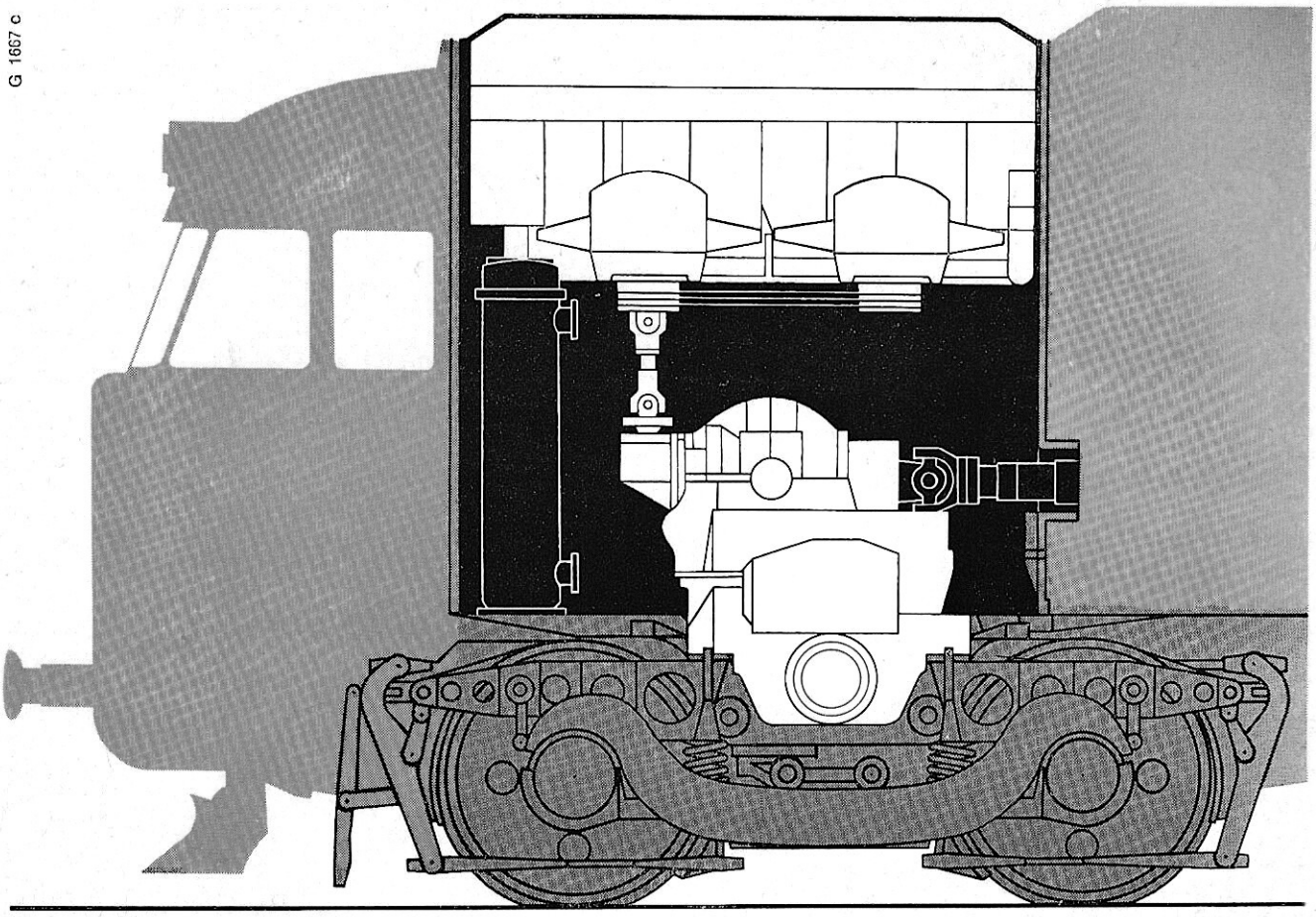

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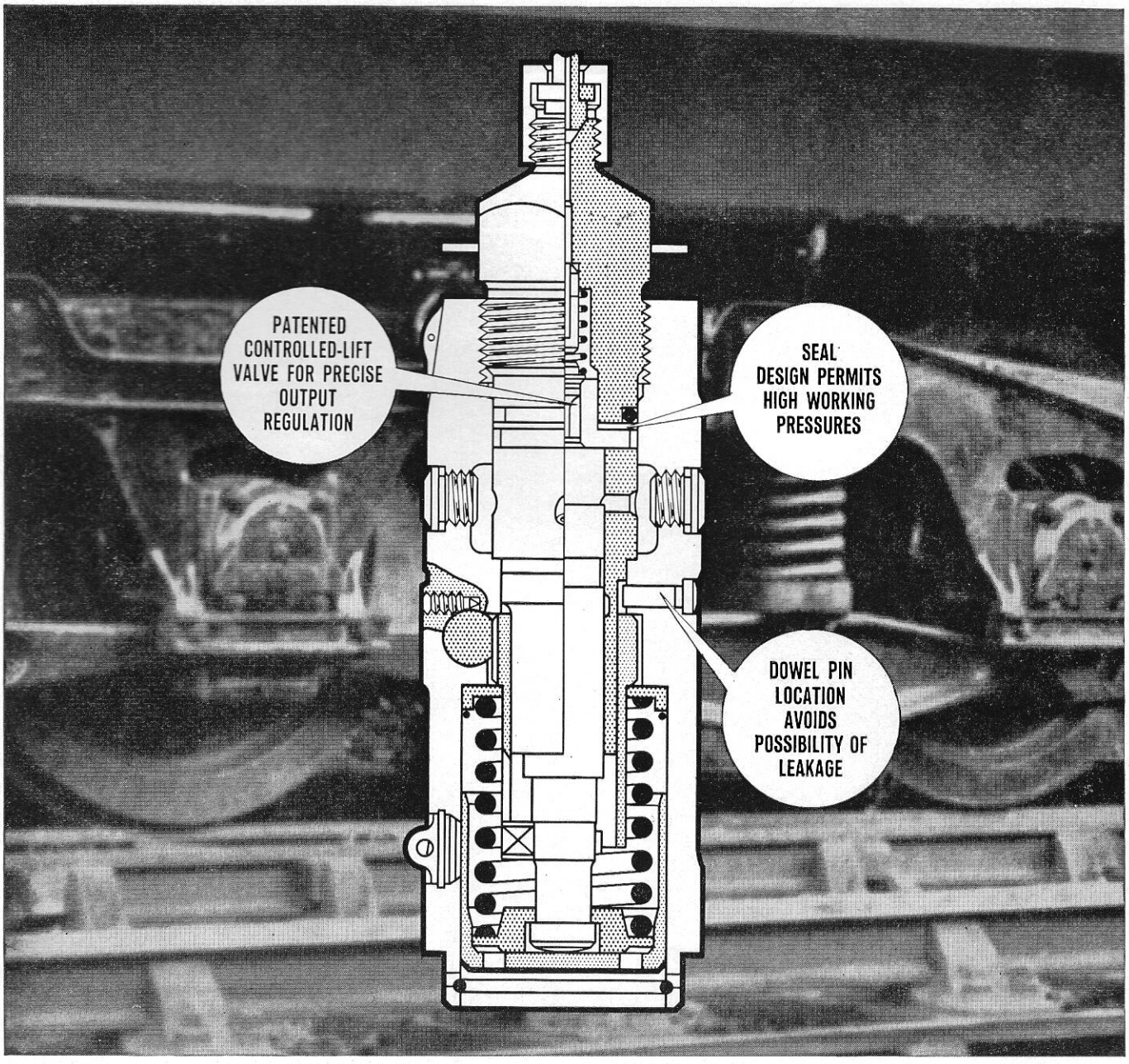

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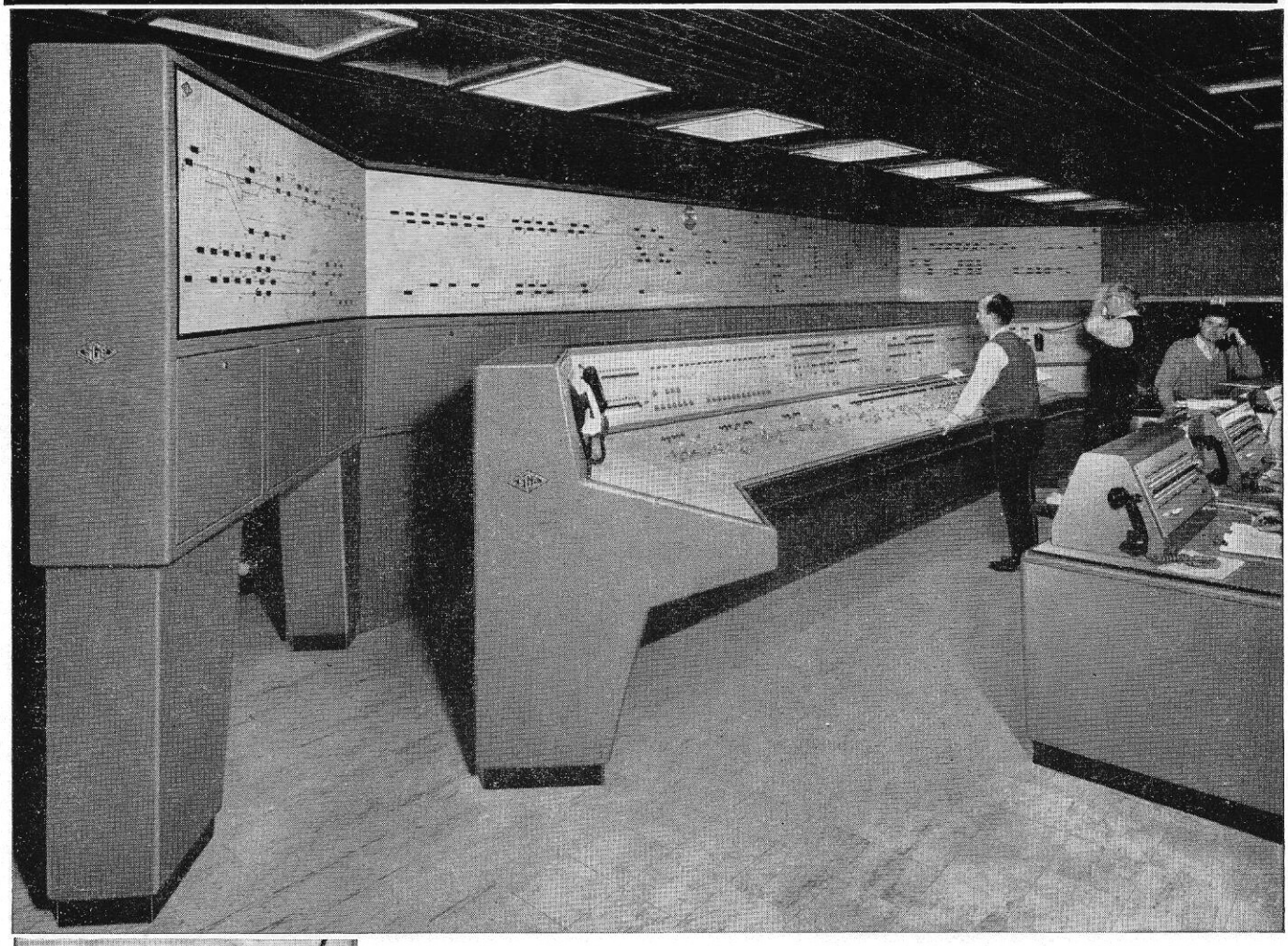

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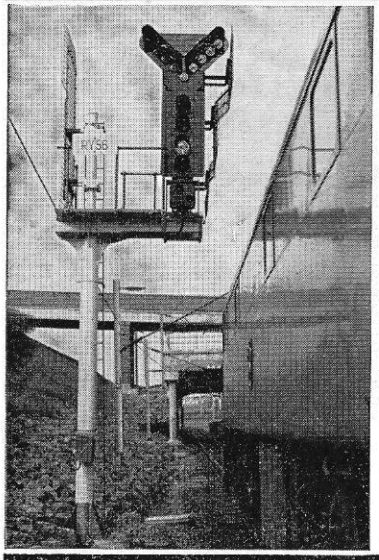

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modern railways

Incorporating THE LOCOMOTIVE RAILWAY CARRIAGE & WAGON REVIEW

Vol. XXI No. 197 FEBRUARY 1965

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The Doctor's departure

IT really is ironic if Dr. Beeching's involvement in transport is ending without the *chef d'œuvre* of a national plan's authorship partly because he is branded as pro-rail. Who would have dreamed this in 1961, when the heavy curtains concealing the dreaded Stedeford Committee parted to reveal him as the BTC's new chairman? Was it only two years ago that the Doctor was being execrated as a butcher after the publication of the Re-Shaping Report? Most incredible of all, who would have imagined that the thumbs down on this count would come from a Labour administration—with Lord Stonham, no less, among its junior Ministers?

In last October's MODERN RAILWAYS a railwayman forecast that the anti-closure onslaught on the BRB would be mild compared with the blistering its "true costs" evidence on road and rail trunk haulage to the Geddes Committee would be given by "those who have money at stake and money to spend to press their arguments". Surprisingly, the road hauliers' union lines to the top of this Government seem to be just as efficient as their party lines to the last. Those lines must have been powerfully energised to ensure that the dangerous Doctor was not given a free hand to shape any overall transport survey on the basis of the BRB's "true cost" theories. So, denied executive powers for a brisk six-months' assault on road-rail co-ordination in the broadest sense, and invited instead to act more as a chief adviser who would pay dutiful court to every interested party, the Doctor has opted out.

The achievements of Dr. Beeching

Not since the start of railways has a railwayman's name become such common currency. And so it should be. Like it or not, his remorseless logic, calmly repeated after every vitriolic attack, has finally convinced public opinion that railways need to be reborn into the second half of the twentieth century. Perhaps the general statistical background of the Re-Shaping Report was known and appreciated by a good many railwaymen long before Dr. Beeching came to Marylebone Road. Possibly many of the specific statistics of the Report were hurriedly and indiscriminatingly gathered, then rather clumsily used to add conviction to a pre-judged argument. No one would argue, either, that the positive side of the Report added up to the utopian system scores of perceptive railwaymen had dreamed of for years (and which the Japanese have virtually realised in their New Tokaido Line). Even Liner and merry-go-round trains are not essentially new concepts.

The first of Dr. Beeching's achievements is, in a remarkably short apprenticeship, to have assimilated so quickly the mass of known facts and orward thinking, then to have framed them into the most lucid, logical exposition of the railway's role in a motoring age which this century is likely to see. He is known to have written a

good deal of the Re-Shaping Report himself. If the facts were there before he started, no one was effectively co-ordinating a policy from what they taught; and dangerously new thinking was positively discouraged. One may be unhappy that the Doctor ignored social consequences—it could even be true that he wrote that and a great deal else into his own mandate. But he was appointed to write a prescription. The country's elected representatives had the chance to reject it if they thought the social consequences too distasteful, and so far a change of Government does not seem to have materially altered their reaction. This, then, is really Dr. Beeching's triumph: that he has succeeded, where many before him have tried and failed, in making the nation face up to the high cost of maintaining a traditional railway—even public transport as a whole—in a motor age; and, on the other, that he has shown pretty conclusively the modernised railway, rid of irrelevant activities, to be a potentially profitable—and absolutely essential —servant of a twentieth-century national economy.

The Doctor's other great achievement is to have transformed the outlook of British railway management. Michael Shanks' dismissal of the industry pre-Beeching as "introverted, technically and commercially backward, organisationally confused and somewhat demoralised" may over-dramatise the picture, but the essential truth is there. Under Dr. Beeching and with his infusion of new blood, management has quickly learned to apply many of the research, costing, production and marketing techniques of outside industry to running and selling a railway. The answer to any new problem is no longer to turn up the files and see how something similar was tackled last year—or even longer ago—but to approach it with a fresh mind. It is no longer dangerous to be a railwayman ahead of one's time. Ability is finding much quicker paths to its right niche at the top. And management generally is vigorously forward-looking. In short, Dr. Beeching has made BR a modern industry—internally at least.

Beeching age can be over-rated

Nevertheless, one can over-rate the Doctor's achievements. The danger of a regime headed by so strong a personality is that it creates its own dogmas, which have to be accepted as blindly as were the traditions of old-style railway working. Marshalling yards, for example, are now anathema. If the kind of freight working that needs them could be superseded quickly by a high degree of block or sectionalised train operation, well and good. But BRB officers hedge about dates if one asks when block working will really dominate the freight scene. There is a crying operational need for at least one new BR yard, at Wigan—to improve the freight working in an area, moreover, which is one of the country's richest in potential rail traffic. Pragmatically, it is foolish to deny the LMR an operational improvement that will be a necessity for years to come if customers are to get reliable deliveries, just because marshalling yards are a dirty word in the book of Beeching theory. And is the Liner train such a vastly superior instrument to the Roadrailer? British Road Services, for one, seem to hold a very different view. Here again, one suspects that the prejudices of a powerful personality at the top have frozen attitudes all the way down. On closures, as MODERN RAILWAYS has remarked before, one trouble has been that every page of the Re-Shaping Report has been venerated like a Sibylline book; it should have been taken more as a code of practice. Statistics are not a god, but a guide.

And how much has BR service to the user improved because of Dr. Beeching—at least up to the time of writing? Not nearly as much, on careful reflection, as one momentarily imagines. For the particularly coveted freight customers, certainly, there have been blandishments and in most cases a vastly better service, thanks to new managerial vigour on both commercial and operating sides of the business. But what else? Beeching or no Beeching, we were bound to have had faster, regular-interval express services on the main trunk routes; the way had been shown by the ER back in the 1950s. A great deal more modernisation for which the Beeching regime is now being given credit would have come anyway—though, granted, under Dr. Beeching there is far more assurance that the money has been wisely spent. For the small customers of BR—who are its most numerous users—there is not so much to show yet as a direct result of Beeching.

A failure to communicate

One reason lies in a major defect of the Doctor's rule at 222, Marylebone Road—failure to communicate. This begins with the BRB's own staff. The deliberate and unannounced break with previous joint consultation procedure that was made in the take-it-or-leave-it presentation of the Workshops Plan set up an antagonism between management and staff that has never really cooled.

Under Sir Brian Robertson, there was excessive tenderness toward the union viewpoint that needed correction. But any sweeping change in human relations needs finesse if co-operation is to be retained. When an industry steeped in tradition is being thoroughly transformed, it is vital for management to carry the staff with them. The BRB patently has not. Too many men on the ground feel that they are just pawns in some sort of staff college efficiency game. They are worse than vague about what is expected of them or what could be their future, and what the new methods of working are meant to achieve—except a few more redundancies. These are the men who create BR service as it affects the average man or woman. And too often that service is below par because they have little idea how their own job fits into the developing pattern.

Communication with the public, too, has been lacking. BR may have become a modern industry internally. But too little of the new atmosphere has got across to the public. Only in the past year or so have BR begun to create and sell services in the modern idiom. Only now does imagination seem to be winning the battle with conservatism to create a new rail travel environment relevant to an air- and motor-minded generation, and to promote it with contemporary cunning.

Any kind of promotion for the services BR want to continue, however, has a hard job to offset, on one hand, a sequence of curt announcements that this, that or the other is a traffic BR no longer want to handle; and on the other, apparent disinterest in the services which may be marginally remunerative and are being reluctantly carried on for the time being. The economies have all been made for the soundest motives. But inevitably each brusque announcement has added its ounce to a cumulative psychological impact, which has left the public suspicious that the railway is now being run to prove a theory workable rather than to provide a service.

There is no reason why the refusals of traffic should not have been carried out more gracefully than many have been. Where it was decided to retain marginally remunerative traffics, but to handle them in a more economical way superficially incomprehensible to the layman, the public relations ground should have been much more carefully prepared—and just as much determination shown to make the new method work as is being expended, for example, on Liner trains. One squirms to see more and more letters in the press making antic fun of the National Sundries Plan, largely because it has not been explained in down-to-earth language and because it is being executed half-heartedly.

The fact that the new men of Dr. Beeching's railway have yet fully to appreciate is that so many railway activities go on in a goldfish bowl from start to finish. They cannot be concealed behind factory walls, like so much of modern industry. In that sort of situation, it needs maximum energy and initiative to avoid a misinterpretation of what is going on. Efficient, intelligent and persistent two-way communication with the public is crucial to success.

KINGS CROSS IN CAMERA

The "Flying Scotsman" leaves Kings Cross behind English Electric "Deltic" 3,300 h.p. diesel No. D9013 *The Black Watch.*
Photo by Eric Treacy

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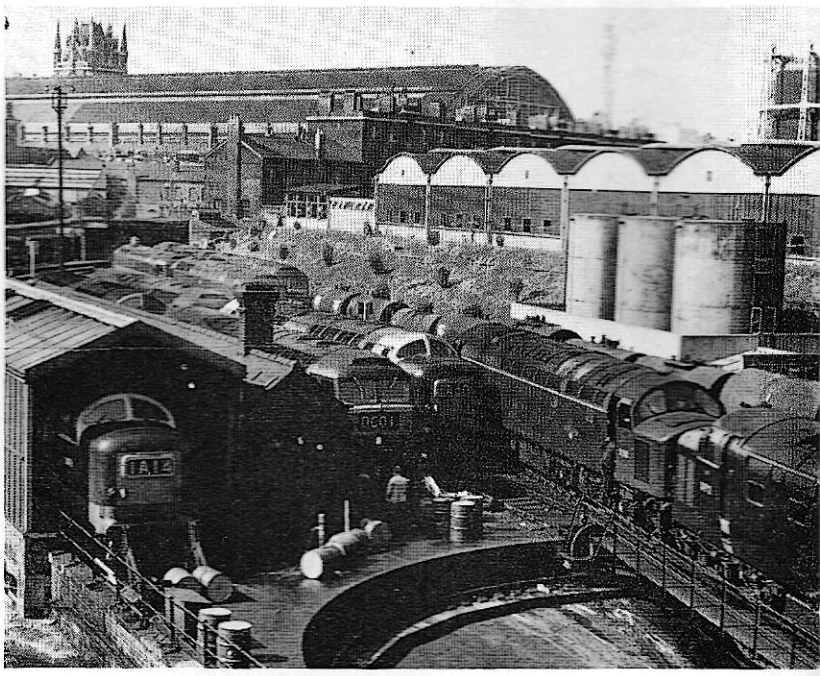

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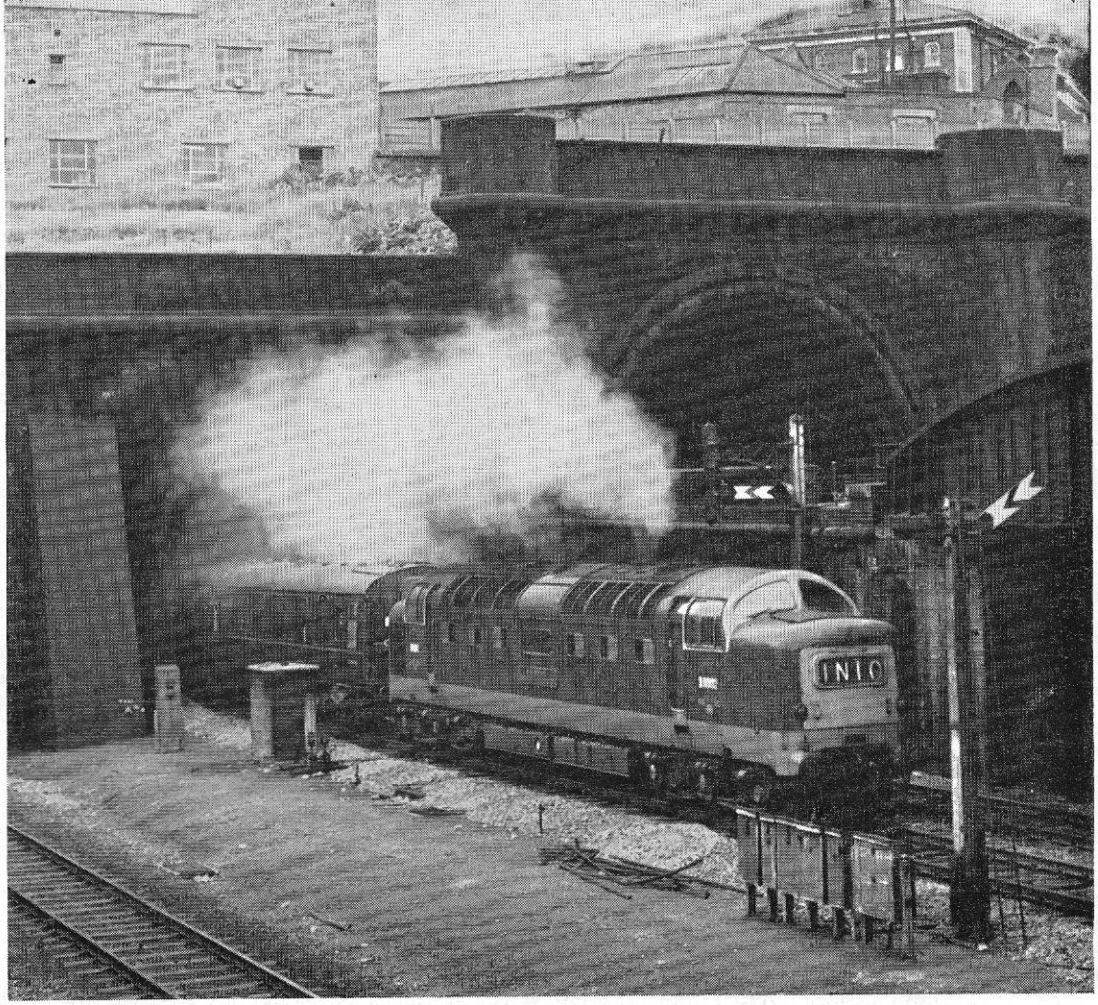


Kings Cross in camera

Top left: The up "Master Cutler" Pullman approaches Kings Cross from Sheffield behind Brush Type 4 diesel No. D1512.
Top centre: An assortment of main-line diesels await their next turn of duty in the yard outside the terminus.
Top right: A down Leeds and Bradford express leaves Copenhagen tunnel behind "Deltic" diesel No. D9002 *The King's Own Yorkshire Light Infantry.*
Below left: The 10.10 to Edinburgh between the tunnels north of Kings Cross behind "Deltic" diesel No. D9007 *Pinza.*
Below right: A Brush Type 2 diesel threads its way out of the terminus with a Cambridge train.

Photos by Eric Treacy

letters

IS THE LMR CARRYING A CAN FOR THE WR?

SIR,—Pleased as anyone would be to learn that a large sector of BR should be in the black by the end of 1965, I think Mr. Fiennes (*January issue*) ought to have pointed out that the Western Region's financial recovery has been partly achieved by offloading one financial cross. He somehow forgot to list in his catalogue of savings the transfer of the Birmingham area to the LMR, which cut the WR's losses back by close on £6m, if I am not mistaken, and which must also have helped to reduce the WR's staff quite substantially.

Elsewhere Mr. Fiennes contentedly talks of steel traffic that is "almost an embarrassment". Again, one rejoices that modern methods are regaining goods from the road. But so far as the block trains to the West Midlands are concerned, the WR is creaming the originating revenue while the luckless LMR is standing the heavy costs of carting the consignments by road from West Midlands railheads to consumer.

By all means, let's applaud the successes of BR. But let's make sure that the applause is not too partisan.

"WEST MIDLANDER".
(*Full name and address supplied.*)

SIR,—Mr. G. F. Fiennes makes some very provocative remarks in your January issue, on which one could comment at great length. Nevertheless, I will be as brief as possible.

Surely his observations concerning Minehead gasworks are more appropriate to the rail-road conversionists than to the General Manager of the Western Region? Is there not an implication that if a gasworks can be fed by road using 12-ton vehicles, so can a power station? Indeed a rail-road conversionist claimed recently in a technical publication that the largest power station could be fed successfully by road using 20-ton vehicles on an improved carriageway. Where does one draw the line—at some arbitrary point chosen by Mr. Fiennes?

"We like commuters" should presumably read "We like London commuters". Those of Bristol, Newport, Cardiff and other cities appear to be expendable. There is no doubt in my mind that BR would be delighted to get rid of Cardiff commuters and may well succeed. Two years ago certain unrenumerative services in South Wales were withdrawn and BR issued a statement that the withdrawals should prevent any further rail closures. Needless to say, within months the next batch of closures was announced. I don't think I will be far wrong if I say that the truncated remains of South Wales commuter services are at present under consideration for further curtailment.

Mr. Fiennes' remark that "16 additional freight trains each way per day are now running through Cardiff" needs some amplification. During the last year, several of the freight lines which avoided Cardiff have been closed (e.g. Treforest–Cadoxton, Penrhos–Tyn-y-caeau Junction, Pontypool Road–Aberdare); in all cases this has caused freight trains to be diverted via Cardiff. Do we understand these to be additional to the 16 trains mentioned by Mr. Fiennes, or are they included in that figure? Whether they are included or not, the additional trains, of course, make for better track utilisation, but it would be interesting to know the additional cost in crew time to operate these circuitous diversions. Maybe the cost has been largely offset by the utilisation of diesel locomotives, enabling quicker runs and shorter turnround times.

"Reshaping loses little through traffic," says Mr. Fiennes. As for holiday traffic to the coast, the general public will no doubt be interested to note that in due course the Minister and Mr. Fiennes will inform them of the mode of transport they must use. Even though this be the truth, it could have been more palatably presented.

S. RICKARD.
Bishopbriggs, Glasgow.

SIR,—The choice of Newport, in the illustration on page 12 (*January issue*), to exemplify the close co-ordination between rail and road is misleading, to say the least. No regular bus services start from outside the station. Those shown there must have been special workings associated with private parties or with the interruption of train services over a section of line because of engineering work or other circumstance. The bus station for out-of-town services is some distance from the railway station and none of the buses on these routes even passes the latter, let alone waits for rail passengers there. Co-ordination gets no further than the presence, in the station forecourt, of a street map showing how to reach the bus station and a notice giving outline details only of the frequency of the various bus services. Both have been there some time, and, welcome though they are, they hardly constitute the kind of close co-ordination which it was intended to depict in the illustration.

A. P. CLARK.
Newport, Mon.

The National Sundries Plan

SIR,—The letter from R. A. Gold in your December issue regarding the National Sundries Plan mentions specifically a movement from Potters Bar to Tring via Welwyn Garden City and Crewe. This reminds me that for nearly a decade there were several trunk road motor services operated by the BR cartage fleet, radiating from Welwyn Garden City. These were to Hertford and Ware, to Hitchin and Letchworth and via St. Albans and Watford to Slough. When introduced, this last aroused appreciable opposition from union branches in London because it took away work from the terminal staffs there, but all three nevertheless continued to run until reorganisation of arrangements a few years ago. The official reason for their cessation, particularly the Slough service, is not known, but it is believed that latterly the traffic dropped considerably. In theory, collection could be made in Welwyn Garden City during the morning and the sundries trunked during the afternoon, with delivery by local motor on the following day. My firm was at one time a frequent user of the service to Slough, but I am bound to say that such rapid delivery was almost never obtained, unless collection by the receiving firm was made from the goods depot. If this service still existed, deliveries to the L.N.W. line in the Home Counties and Midlands could be made much more expeditiously and by a much more direct route than is generally used at present. As it is, my firm's sundries are trunked by C Licence lorry to the Birmingham area and distributed all over the Midlands by a local parcels carrier from there, thus giving a service to our customers which no other organisation can normally match at a competitive price.

The instance of delay at Crewe given by your correspondent is not only by no means isolated, but periodically a general condition at almost all railheads receiving sundries traffic. When describing the transits of sundries traffic, the word most used by all grades of railwaymen is "*ought*"; the fact remains they never, or at least hardly ever, *do* in practice! I have never met a railwayman who will face the reality that theoretical considerations do not usually apply. As your correspondent so rightly says, there is no way of recording delays and because of this it seems very doubtful to me that railwaymen in general have any realisation of the actual transit times which sundries so often suffer. It is easy for them to blame staff shortages for the situation described, but surely such shortage is only a function of the lack of appreciation of the importance of the job. If supervisory staff can be pruned, this will be done quite ruthlessly. The vast majority of traders would be willing to pay more for a first-class service.

I have always preached to railwaymen that, operating considerations apart, it matters not one jot whether trains carrying sundries average only 5 m.p.h., provided that on arrival at destination the movement is continued. It is quite useless to have trains speeded up to average 40 m.p.h., if all that happens is that the wagons stand all day or longer in the yards at the other end. "Overnight delivery" is in very many instances a term to which lip service and nothing more is paid. Its failure is due entirely to the almost complete disorganisation which has existed for many years at railway terminals and which shows no sign of any improvement, despite modernisation.

Another item of interest in your December issue was the article on the proposed closure of the Oxford–Cambridge line to passenger traffic. So much of what you say regarding the Heads of Information can be likened to that which occurred in the proceedings connected with the proposed closure of the Hatfield–Dunstable line earlier this year. In this case British Railways at first refused to consider any alternative bus service; then, having given way, they continued to decline to subsidise right up to the day of the inquiry. It was obvious from the reaction of those attending that the announcement they had agreed to do so was taken as a piece of sharp practice. Again the bus service origin-

ally proposed bore no relation to the number of people requiring to be moved in the rush-hours, which point, among others, was amply demonstrated. In this case the TUCC has advised the Minister against closure and in view of the change of Government it now appears likely this line will remain open.

Welwyn Garden City. A. L. LAMBERT.

"British Rail"

SIR,—May I correct a slight error which appeared in a caption on page 31 of my article "British Rail, The New Image", in the January issue. Referring to the new symbol and logotype, the caption states that these will normally be reproduced in blue for publicity purposes. In fact it will be in blue for shipping publicity only. Flame red will be used for rail publicity—except, of course, when only black ink is used, in which case the symbol and logotype will be black.

A modification to the BR ship livery has been made since the article was prepared. White paint replaces pearl grey for upper deckworks, in order to enhance visibility to other shipping in poor weather conditions, following complaints by some ship's masters.

Crawley. BRIAN HARESNAPE.

The Oxford–Cambridge closure: a curious case

SIR,—The main points to remember about the Oxford–Cambridge line, whose closure case history was outlined in your December issue, are that it is cross-country, that it is also a freight line and that most of its stations are on other lines.

Because of this the costs of running a passenger service should be quite low, as we are told in the BRB report on road-rail "true costs" that track costs for fast freight are much the same as for passengers. Moreover, many of the passenger stations are already self-supporting on the trunk lines they also serve, so that only marginal costs need be charged for their use by the Oxford–Cambridge trains. Finally, signalling can be controlled from boxes near stations which are also controlling the other lines, so that again the financial load would be spread.

The advantages of this service, if it were extended to Ipswich or Harwich at one end and Didcot at the other, are that it would avoid London and the usual inconvenient change of stations involved for a large number of cross-country journeys. It might even be worth while to extend the route to Newbury to connect with services to the South-West. Existing stock used intensively on a limited-stop service should be able to provide at least a 2hr, but preferably a 1hr service. The towns on the line are expanding and increasing support can be expected after an initial publicity campaign to convince the public that BR means to attract business to this line.

The main handicap is that there are too many Regions involved. Let's try to run it as BR with a planned integrated service as an indication of what can be done when the will is there.

Cranfield, Bedford. C. J. CHARNLEY.

SIR,—How much of the allegedly unsatisfactory state of the economics of the Oxford–Cambridge line passenger services results from a lack of inter-Regional co-ordination of effort? I refer in particular to the Western Region's unwillingness to advertise the excellent day fares available from Oxford, especially the 17s 6d day return fare to Cambridge. In such publications for Oxford freshmen as *Vade-Mecum* and *Cherwell*'s "What's What" the coach service to Cambridge by road is mentioned, as are train services to Paddington, but there is no reference whatsoever to cheap fares and train services to Cambridge. There is, moreover, a similar lack of information in the local press and on street posters. In contrast to its great publicity for Paddington services, Oxford station itself seems singularly reluctant to advertise this most attractive facility to the travelling public.

The attractiveness of the latter derives both from the fare and the presence of a fast morning service from Oxford at 9.44 and an evening return at 19.01 or 21.16. The latter, however, spoils the whole effect by calling at all stations to Bletchley and terminating there on Saturday, the day when most undergraduates are likely to be travelling. If the LMR could be induced to delay the 22.22 ex-Bletchley on Saturdays, it would provide a most useful connection, which, if advertised by the Western Region with the alacrity and vigour shown by them in regard to Paddington facilities, would give a welcome boost to takings.

"42343".

(Full name and address supplied.)

The rejuvenation of the Cambrian line

SIR,—In his December article, Mark Bourne says twice that the intention is to single the Cambrian throughout. The process of closing boxes and singling has been going on for a few years. Double track originally extended beyond Harwood to the point of divergence of the Minsterly branch and was successively cut back to Harwood and then Hookagate. Breidden, which was latterly open for, I believe, only one shift, has been closed.

At Buttington the old junction box has been closed and that and the South ground frame removed. There are two parallel single lines to Buttington Junction, a new box which has taken over the functions of Buttington Level Crossing box in respect of the adjacent level crossing. Double track, shortened thus by about ¾ mile, extends thence through Welshpool to Forden.

The next stretch of double track, Newtown to Moat Lane West, would have been singled by the WR had the line remained under their control. Only a ground frame would have remained at Moat Lane, for a connection, worked as a siding, to Llanidloes.

At Machynlleth the two signalboxes were replaced a few years ago by one. I do not, therefore, see what is meant in the article by the statement that the two lines through the station are worked as single lines. They may be available for use in either direction but token working will not be in force as the lines are within "station limits" and are not block sections.

Old Hill, Staffs. P. D. HINGLEY.

SIR,—In connection with the articles in the December 1964 issue on the Cambrian line and on locomotive practice and performance in the Highlands, may I make a plea for the abolition of the single-line token system in this country? Other countries in much less advanced stages of development, such as various African countries, have passed on to more sophisticated CTC or at least direction-lever systems using track-circuiting or axle counting. The article on the Cambrian line expressly mentions that "the principal checks are at the loops for token-exchange"; also, people cannot reasonably be expected to go from under cover either for repeated walks to lineside token-exchange equipment or, even worse, to stand at the lineside in all weathers and act as their own token-exchange equipment. This argument would seem to apply very much to the Highland line. The abolition of token working would also speed up traffic when there was a peak in one direction, for long single-line sections could be signalled both ways for manual or automatic block working, with great advantages for summer Saturdays on a line like the Cambrian.

Cecil J. Allen's 10.30 from Inverness to Perth was, of course, correctly held on the down side of Pitlochry to await the northbound train clearing the points at the south end of the station, but the provision of catch points immediately after and interlocked with the starting signal would surely obviate the need for the ludicrous rule of a train having to stop before the home signal of a passing loop if the following single-line section is occupied. Another point, quite understandable in Highland weather, is that since—if I remember rightly—the token-exchange equipment for both directions is near the signalbox at the north end of Pitlochry, the signalman has much less of a walk with his precious ironware if he lets a northbound train into the loop first than vice versa.

Hatch End, Mx. W. J. WETENHALL.

An extended South London service?

SIR,—Probably very few of your readers know that BR propose to close East Brixton station, on the South London line of SR. From one of the documents submitted by the Regional general manager to the TUCC for London, the reason for the proposed closure is that the station requires rebuilding at a cost of £64,000 and that this capital expenditure can no longer be delayed owing to the dangerous state of much of the structure.

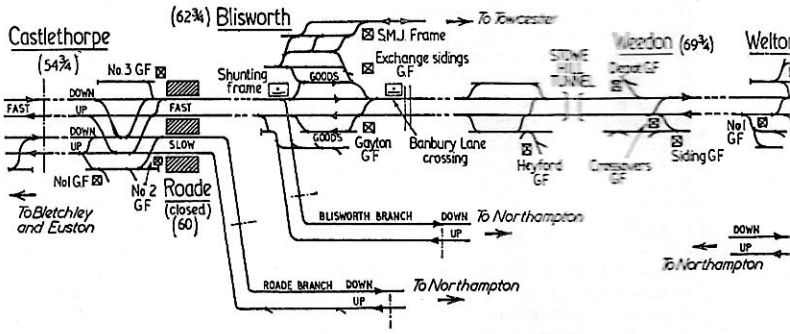
The normal procedure has been followed and the TUCC has since made its report to the Minister of Transport. It has also made a public statement that the proposal would cause hardship to users of the station who travel on the section of the South London line between Battersea Park and South Bermondsey, or to and from any intermediate stations on this section, during peak hours, the early morning or the late evening. The Committee have further stated that in their view it would not be practicable to alleviate this hardship by any alteration or augmentation of the bus services operating in the areas of South London that are linked to East Brixton by the train service.

It would seem, therefore, that the Minister of Transport will have little option but to refuse sanction for the closure. However, this does not mean that no changes are necessary in the interests of passengers or that of the finances of BRB. A passenger train service between London Bridge and Victoria via the South London route would appear to have outlived its usefulness. Nevertheless, the line could well be incorporated in a more extensive route stretching from Woolwich in the east to Kensington Olympia in the west. If East Brixton station has to be rebuilt, it should be rebuilt adjoining the existing Brixton station (many years ago there were platforms at Brixton for Loughborough Junction loop line trains), where connections could be made with trains from the Bromley area. If, as is mooted, the LT Victoria Line is extended through Vauxhall and Stockwell to Brixton, that would be an added reason for rebuilding at Brixton rather than on the present site.

Trains would run from Woolwich via Lewisham, Peckham Rye, Brixton and Clapham Junction. Electrification would be necessary between Wandsworth Road station and the northernmost bay platform at Clapham Junction and also between there and Addison Road. Additional stations

concluded on page 120

The latest power signalbox to be opened in the LMR a.c. electrification area covers more track mileage than any other on BR. It replaces 22 previous signalboxes and controls 35 miles of the West Coast main line. There are ten remotely-controlled interlockings



RUGBY'S NEW

G. M. Kichenside

THE LMR's new power signalbox at Rugby, commissioned last September, covers the largest track mileage of any BR signalbox and has one of the most extensive areas to control of any in Western Europe. Its territory comprises: 35 miles of the West Coast main line from Castlethorpe to Brinklow, near Nuneaton; parts of the Northampton loop, but excluding the Northampton area itself; the Rugby–Birmingham line nearly to Coventry; and short lengths of the Rugby–Peterborough and Rugby-Leamington lines. This totals 59 route miles and 159 track miles.

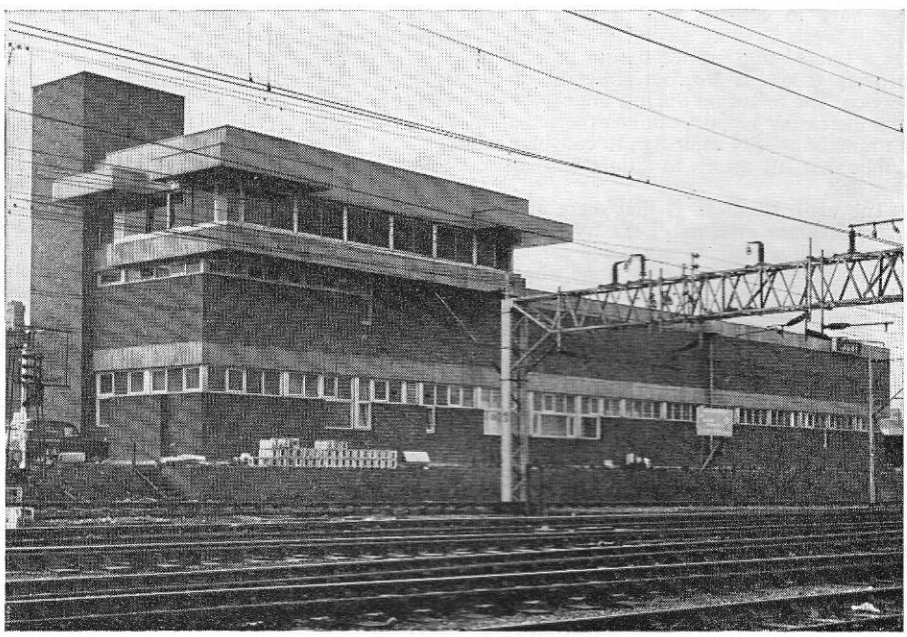
The new box has replaced 22 mechanical signalboxes and allowed a saving of about 70 signalmen's positions. In practice, however, staff shortage has resulted in unfilled vacancies and the actual number of signalmen displaced is considerably less than the positions abolished. The new box is normally manned by a traffic regulator, two signalmen, two train recorders and a station announcer. For about a year, however, while Rugby is at the boundary between diesel and electric traction, a traffic inspector is based in the new box to supervise locomotive changes. The needs of the new box have entailed a slight increase from 21 to 25 in the number of technical staff for maintenance and repair of signalling equipment.

The lines controlled by the new box have been equipped with continuous track circuiting, AWS and multiple-aspect colour-light signals. The signalling is four-aspect on the main line via Weedon to the Trent Valley and Birmingham routes, three-aspect on the Northampton loop, and two-, three- or four-aspect signals as necessary on the branch approaches to the main colour-light area.

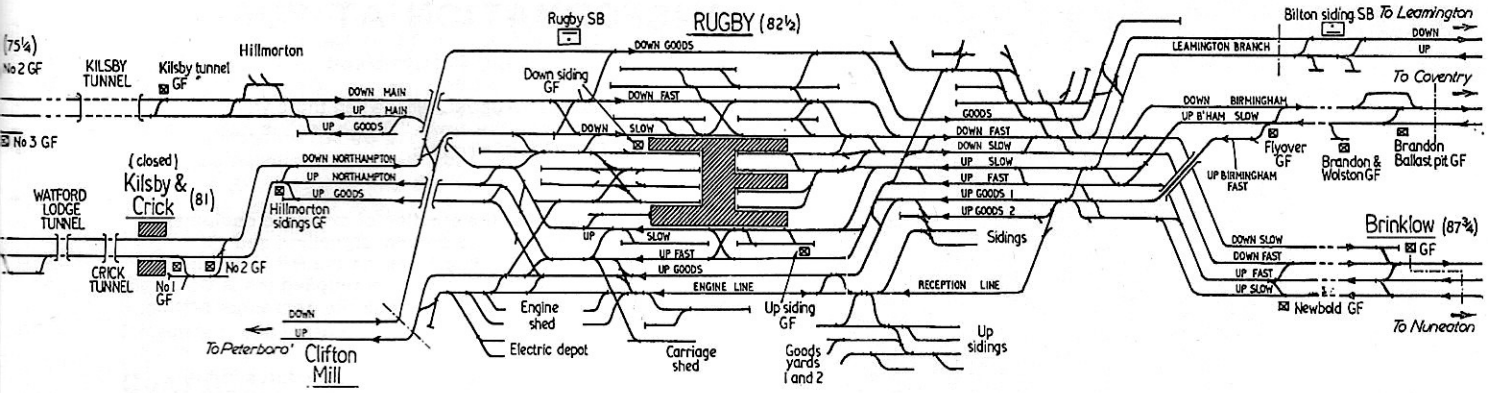
The Rugby layout is complex

Unlike the Watford installation (described in our September, 1964 issue) which consists primarily of a four-track main line with four groups of fast/slow crossovers, the layout controlled by Rugby covers an area varying from plain four-track and double-track line to the complex Rugby station area. The southern extremity of the Rugby control area is between Wolverton and Castlethorpe on the four-track main line from Euston. At present the next signalbox to the south is Wolverton No. 2, but the new Bletchley power box, to be commissioned in July, will eventually operate the signalling southwards from the Rugby control area.

As can be seen on the accompanying track plan the four-track main line extends as far as Roade, where it splits into two double-track routes, the main line via Weedon to Rugby and the secondary main line via Northampton to Rugby. At Blisworth a double-track branch forms an alternative route to Northampton and also gives access to the former LNW Northampton–Wellingborough–Peterborough line at North-



From left to right: The exterior of the new Rugby signalbox: the operating floor, showing the illuminated track diagram, the operating console and traffic regulator's desk; and a close-up of a section of the push-button entrance-exit console.



BOX SIGNALS 159 MILES

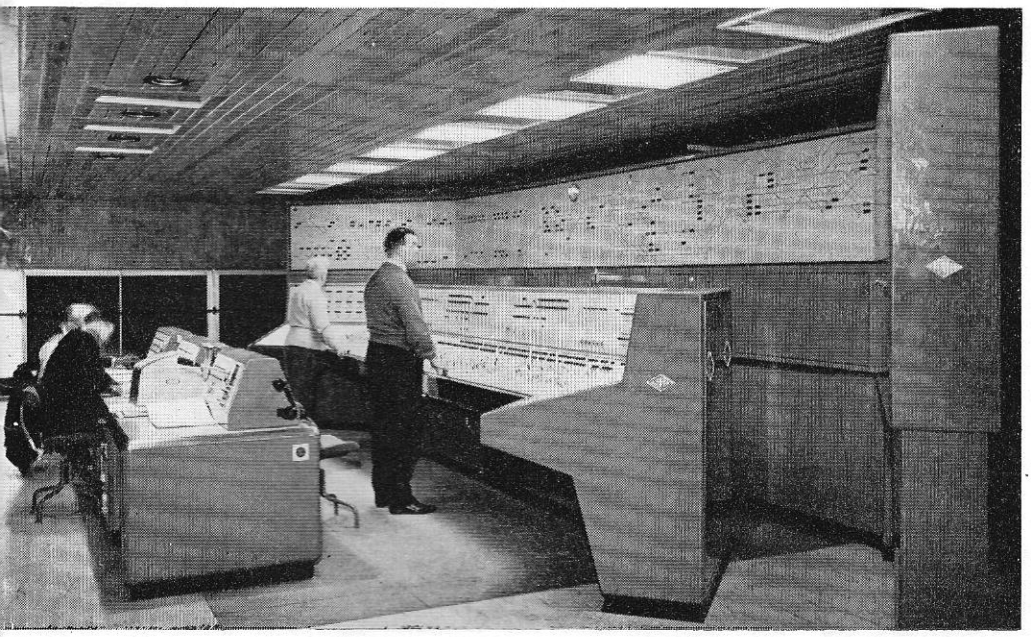
ampton; it is normally used by only a few trains between Rugby and London and in cases of emergency or special diversion. At Blisworth there is also a siding connection to the former SMJ branch to Towcester.

The Northampton station area and approaches do not come under the control of the Rugby power box but will be worked from existing signalboxes, in which the present mechanical lever frames are to be converted to electro-mechanical operation. The functions of Middleton box, between Northampton and Roade, will be transferred to Northampton No. 1, and those of Long Buckby, Althorp Park and Northampton No. 5 will be taken over by Northampton No. 4. The lower maximum speeds permitted on the Northampton loop do not require four-aspect signals and three-aspect signals are normally employed. The Northampton resignalling is to be commissioned during the weekend of February 13–15.

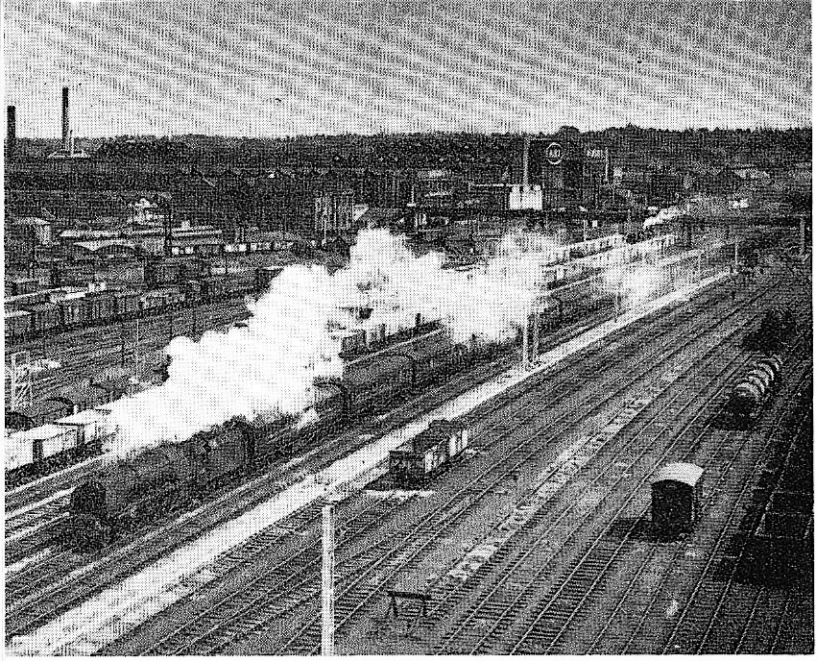
The direct and Northampton routes rejoin about 1½ miles south of Rugby and run parallel as far as the flyover junctions at the station approaches. These flyovers carry the down Northampton and down Peterborough lines over the up lines, and a down goods line extending from the down Northampton and Peterborough lines over the down main line. Rugby station itself consists of a large island platform with one down and one up platform line and north and south bays. Both up and down through platforms are respectively divided centrally by scissors crossovers from the adjoining up and down fast lines to allow two moderately long trains to stand at the platforms together and arrive and depart independently, although this facility is not used as much now as in years past. Adjoining the station on the up side are the former steam motive power depot, the new district electric depot and carriage sidings; at the northern approaches are freight sidings and private sidings from a number of industrial concerns. Six running lines through the station area—down goods, down fast and down platform, up platform, up fast and up goods—allow the various types of traffic to be segregated and provide the operators with ample facilities for regulation. A seventh line—the up goods No. 2—at the northern approaches to the station allows freights from both the Birmingham and Trent Valley routes to be held simultaneously without obstructing the passenger lines.

The new flyover

About a mile north of the station is the flat junction with the Leamington branch and the junction between the double-track Birmingham main line and the four-track Trent Valley route to Nuneaton, Stafford and the North. Conflicting movements between up Birmingham and down Trent Valley trains were eliminated recently by the new flying junction which carries the up Birmingham fast line over the Trent Valley



TRANSFORMATION AT RUGBY

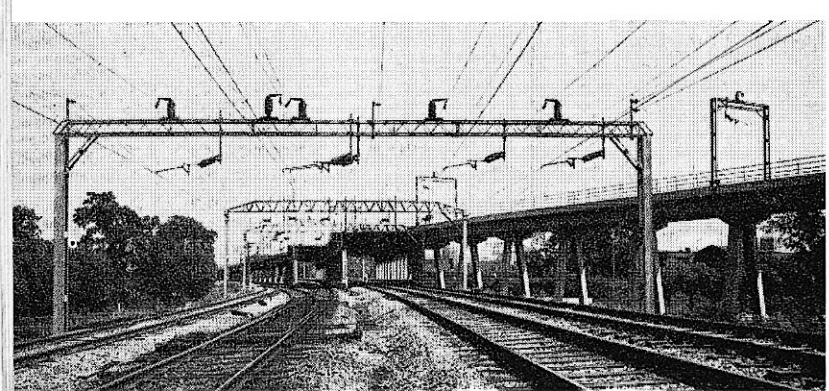


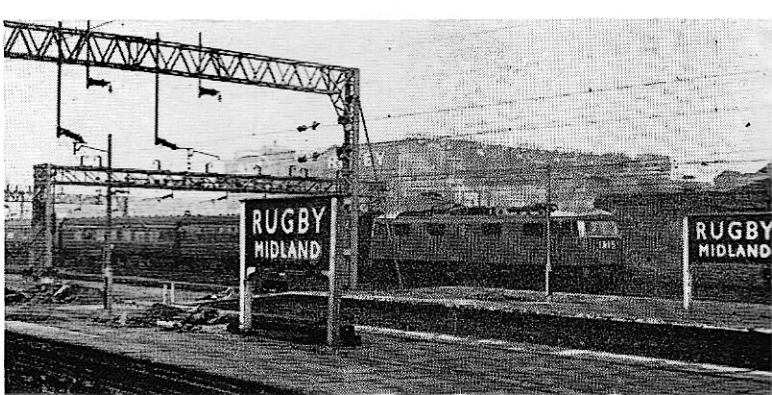
The north end of Rugby in August, 1963, when there were few signs of electrification—the down "Welshman" is headed by Stanier 4-6-2 No. 46255 *City of Hereford.*
Photo by Colin P. Walker

Centre: The same area after the erection of overhead equipment but before the replacement of the original signalling and signalboxes; the 100ft floodlighting tower on the left is one of five erected in this area by BICC, who also supplied the overhead equipment. In the background is the passenger station.
Photo by BICC

Bottom left: Overhead equipment on portal structures in the area of the new flyover north of Rugby. *Photo by BICC*

Bottom right: An electrically-hauled train enters Rugby from the north behind English Electric locomotive No. E3099.
Photo by British Railways





down lines and up fast line, then makes direct connections with the main up fast or up goods lines approaching Rugby. The flat junction, however, has been retained to allow up Birmingham line trains terminating in one of the North end bays at Rugby to gain the up slow line without crossing the path of a train on the up Trent Valley fast line, as would be the case if the Birmingham train were routed over the flyover.

On the Birmingham line the Rugby control area extends to within two miles of Coventry. From this point northwards the signalling is controlled by Coventry power box. Rugby box controls the Trent Valley line as far as Brinklow, at which point the down slow and down fast lines merge to form a single down line. The next box to the north is Nuneaton, described in the December, 1963 issue.

Console is only 20ft long

The signalling controls for the entire area under the jurisdiction of Rugby signalbox are grouped on a track diagram in a compact 20ft-long entrance-exit type operating console. Track circuit and four-character train describer indications are displayed in a second larger track diagram, 31ft 7in long, behind the operating console. The entrance-exit panel is equipped with the now standard push-buttons, most of which, except for the first and last buttons of each group, serve as exit buttons for the rear section and entrance buttons for the section ahead.

The routes are divided into a number of controlled areas in which the signalman must set the routes manually. Between the controlled areas the signals are automatic and controlled solely by track circuit occupation. In most of the controlled areas, but not in the Rugby station area, the controlled running signals can be set on automatic working for the straight route by the operation of auto buttons on the panel alongside the signals concerned. When the signalman wishes to take control to make a crossing or diversionary move, he pulls up the auto-button before or during the passage of the last automatically-signalled movement, after which he must set the new routes manually until conditions are suitable for automatic working to be re-established.

The route-setting push-buttons must be pulled up momentarily by the signalman to cancel a route previously set or after the passage of a train through the route. In the purely automatic sections the signalman normally has no control over the signals, except in selected cases which are provided with restoration buttons on the panel for use in an emergency. Other automatic signals are themselves equipped with key switches for emergency use by authorised persons.

Remote interlockings and ground frames

The control console has individual point operating switches, which are employed if the route buttons fail to set a route correctly, and also ground frame release switches, telephone selector keys and the over-riding switches for the remotely controlled interlocking areas.

As in the Watford and other recent LM signalling installations, a number of siding connections with the running lines at intermediate stations or small goods yards and certain emergency up/down crossovers are controlled from ground frames at the site. The ground frames are released from the Rugby console provided that the conditions permitting their operation are suitable. In all, 23 ground frames and the larger Blisworth shunting frame are released from Rugby. Banbury Lane level crossing, which has been equipped with lifting barriers, is worked from the crossing signalbox, which has direct control over the normally automatic signals immediately protecting the crossing in each direction. The gate box controls are not released from the Rugby console, although when the crossing is in use an indication is displayed on the Rugby diagram.

The outlying controlled areas are worked through ten remotely-operated interlockings at Brandon Ballast Pit, Newbold, Rugby North Flyover, Rugby North, Brinklow, Hillmorton, Watford Lodge (between Long Buckby and Kilsby & Crick on the Northampton loop), Heyford, Blisworth and Roade. Eight of the remote interlockings are controlled from the Rugby panel through Timplex time-division multiplex equipment, which employs only two pairs of wires for control and indication circuits between Rugby and the interlocking concerned. In this system the equipment scans several times a second, and in turn, each circuit with which it is connected. Any change in a circuit that is detected by the equipment is transmitted as a coded impulse to the receiving equipment at the opposite end of the remote-control circuit, where it is translated into the appropriate normal signalling or indication circuits. Rugby North Flyover and Rugby North interlockings are controlled by direct-wire cabling from Rugby box.

In the event of a major failure of the control or indication equipment, the Rugby signalman can use the over-riding switch for the interlocking concerned to set up automatic working for the straight routes in the area it controls, until the failure has been rectified. For Roade, however, a second over-riding switch allows automatic working to be established between the fast lines and the Northampton branch. By these means trains can be kept moving, even though the Rugby signalman has temporarily lost direct control of the equipment.

The four-character cathode-ray type train describer indications are displayed in apertures 2in wide by 1in deep at each signal berth position on the track diagram and are clearly visible to the signalmen, and to the traffic regulator and train recorders sitting at the long desk behind the signalmen. Where permissive working is authorised on goods lines and on certain platform lines, the describer indications are designed to allow two codes to be displayed for each signal berth. At present, the indications from the fringe boxes to the south—Wolverton No. 2, Middleton (from the Northampton loop towards Roade) and Long Buckby (from the Northampton loop towards Rugby)—are set up and transmitted manually from those boxes to the Rugby diagram, after which onward movement across the Rugby diagram and transmission to Nuneaton or Coventry boxes is controlled automatically by a train's occupation of track circuits. When Bletchley box is commissioned, the describer indications will be transmitted automatically between Bletchley, Rugby, Nuneaton and Coventry boxes. In the Northampton area, four-character train descriptions will be transmitted automatically from Rugby power box to "1st, 2nd, 3rd train approaching" describers in the fringe boxes at Northampton. Between the four surviving Northampton boxes, train descriptions will be transmitted manually with manual cancellation and not by track circuit occupation.

Intelligent regulation is vital

Traffic flows in the Rugby area consist of: express passenger services from London to the North, most of which normally travel via Weedon, although some are booked to call at Northampton; stopping passenger services to London via Northampton; and local services to Birmingham and along the Trent Valley line to Nuneaton and Stafford. While electrification work is in progress the Birmingham–London express service has been transferred to the Paddington–Birmingham route and the present-day traffic handled by Rugby is by no means representative of future traffic levels.

Freight services naturally cover all types of traffic, from the local pick-up trip workings to fully-fitted express workings between London, the Midlands and North. Most of the slower low-class freights use the Northampton loop between Rugby and Roade, but many express freights travel via Weedon. In fact the two routes via Weedon and via Northampton are, in effect, used respectively as fast and slow lines as though they formed a normal four-track route on the same alignment, and drivers of non-stopping trains booked to run over one route may be diverted over the alternative route without previous advice. There are also local freight services on the Towcester, Blisworth–Northampton, Peterborough–Rugby and Leamington–Rugby branches.

Rugby's importance as a major traffic centre means that intelligent train regulation to ensure that important passenger and freight trains are not delayed by slower trains is vital to the smooth working of traffic. The traffic regulator can see at a glance the traffic position over the 35 miles between Castlethorpe and Brinklow and can thus plan regulating moves some time before they actually occur. Nevertheless variations in driving techniques, particularly on freight trains, can still lengthen or decrease running times sufficiently to upset regulating plans to within a few minutes. The regulator, however, can maintain a continuous watch on train running and alter regulating decisions in the light of changing circumstances.

For example, an up freight booked to run via Weedon and

cross to the up slow line at Roade may have an ample margin in front of an express when leaving Rugby, but for one reason or another lose time. If the following express is gradually closing up on the freight, with the possibility of signal checks before reaching Roade, the regulator may decide to put the freight into one of the goods loops at Heyford or Blisworth instead of letting it precede the express to Roade. In the down direction approaching Roade, regulating decisions for trains crossing from fast to Northampton or slow to Weedon lines are made more difficult by the fact that the Rugby regulator has only the four miles from Castlethorpe to Roade under his direct supervision and must rely on telephone or teleprinter advice of the running of down trains before they appear on the Rugby diagram. The Rugby men also have no direct knowledge of train running or possible congestion in the Northampton area except by telephoned advice from the Northampton signalmen.

The Peterborough branch is employed extensively as far as the first station. Clifton Mill, to which point it is electrified, for transferring locomotives from the up to the down sides of Rugby station. This feature is particularly valuable with the present locomotive change for all trains. Electric locomotives from up trains or from the district electric depot run down to Clifton Mill and return on the opposite line via the flyover to reach the down main lines. This move avoids the alternative of a double shunt from the up lines into the south end bays to gain the down lines, or the use of the crossovers from the up and down engine line on the extreme east of the station across the up goods, up fast and up slow lines to reach the down lines at the north end of the station.

Station speed limit raised to 60 mph

The year or so before full electrification is completed to London and high-speed schedules introduced will give the Rugby operators a much-needed breathing space to become accustomed to their new equipment and the extensive operating area it covers. Schedules calling for 100 m.p.h. speeds will not allow much margin for regulating errors if delays are to be avoided. The speed limit on the fast lines through the station area has been raised from 45 to 60 m.p.h. and the headway for following expresses running unchecked is about 3min. The old signalling allowed non-stopping expresses to be scheduled at about 7min intervals, but as so many trains called at Rugby, average headways had little meaning in practice.

Modern telecommunications are vital to the new high-speed age and Rugby box is equipped with telephone equipment which will ultimately form part of the all-line railway-owned STD network, and a teleprinter receiver at the traffic regulator's position. Ultimately the new box will take over some of the train running supervision functions of the present Rugby district control office.

Most track circuits are of the single-rail d.c. type immunised against false operation from the 25kV traction supply. In Kilsby Tunnel (2,426 yds long) a special type of electronic double-rail track circuit has been used to avoid the problem of installation and maintenance of cut-section equipment. Provision has been made for the installation of a signal for each direction inside Kilsby Tunnel should these be needed at a later date. At present the signal spacing gives a double-length section through the tunnel.

Geographical circuitry has been employed extensively in the relay rooms, which have conventional relay equipment. This system employs standard types of pre-wired relay sets packaging the circuit requirements of signalling route selection, interlocking and controls for points and signals; the sets are both positioned and interconnected by cabling in the same geographical arrangement as the track layout itself. The pre-wired sets consist of either six- or 12-way miniature plug-in relay mountings, complete with jack-in connections giving respectively 100 or 200 circuit outlets. The mountings are provided with registration pins which coincide with appropriate holes in the sets, to ensure that incorrect exchanges of sets cannot be made. The combination of relay plug-in, pre-wired sets and jack-in facilities gives a further economy in the number of spares for geographical systems, as it is not necessary to hold complete sets with relays in reserve. Only spare pre-wired set frames and a limited number of relays need be held as the relays can be transferred at the time of exchange, or without removing the set from its mounting.

The signalling and train describer equipment in the box were supplied and installed by SGE (Signals) Ltd. under the direction of Mr. E. G. Brentnall, Chief Signal & Telecommunications Engineer, LMR.

Education is keynote of new BR travel publicity

New London map makes excellent impression

ONE of the first items of publicity material to appear under the British Rail logotype signifies a new outlook. It is a brand-new poster map of the BR network in the Greater London area (*see facing page*)—a travel aid for which there has long been a desperate need. For once, a BR map has been conceived as a clear, comprehensive guide to unknowledgeable travellers, not just a rough and ready record of territory and towns to which railways run.

The model is obviously London Transport's schematically-coloured, diagrammatic map of its network. Each BR route on the new map has been colour-coded to indicate not just the useless detail, consumer-wise, of its operating Region, but the specific terminal into which it runs, assuming that through services are available throughout the day. A separate code has been used for routes over which trains are run only at the peak hours, such as Finsbury Park to Broad Street or the Metropolitan Widened Lines. Branches served by local trains only that make connections with services into and out of London termini, such as Wimbledon to West Croydon, are also indicated differently. All stations with car parks and interchange stations with London Transport are plainly keyed. Any housewife with minimal knowledge of BR, or visitor from the provinces or abroad, should not have the slightest difficulty in spotting at a glance on this map the London terminal to which any station in the area offers a service, either directly or with an intermediate change of trains.

There is little to be faulted in the detail of the presentation. It is hard to see how the several conflicting services to different termini from places like Sutton or East Croydon could be more clearly separated, but one or two diagrammatic distortions seem needlessly exaggerated, like that which makes the Staines West branch look as many miles long as the main line from London Bridge to Norwood Junction. One feels that "connecting" rather than "local" services might have been a better choice of words for services like Broxbourne–Hertford East (which surely has some through peak services, anyway?) and that a stronger legend should have been used for them, to avoid any wrong impression that they are only useful for local journeys.

The map is now being posted, not only on BR and LT

stations in London, but throughout the country and BR commercial officers have high hopes that it will stimulate off-peak use of London's suburban lines. Later, a pocket folder version is to be produced for free distribution in massive quantities.

The essence of the new London map is that it recognises the ignorance of a growing proportion of the modern public about BR. If they are to be persuaded to use the railway, they must be taught, in the clearest fashion, what it has to offer. One cannot assume that the non-user of rail travel these days has even basic knowledge of BR's various facilities and services. One railway officer had this forcefully brought home to him during the recent Association of British Travel Agents conference at Brighton, when he questioned visitors to a BR sleeping-car berth mock-up in a local store. One executive's wife refused to believe that accommodation of this standard was available on any BR night trains; it must be, she insisted, a replica of a Continental vehicle or a ship's berth. Another was convinced that BR sleepers were still laid out on the old U.S. Pullman pattern, with curtained upper and lower berths each side of a centre gangway.

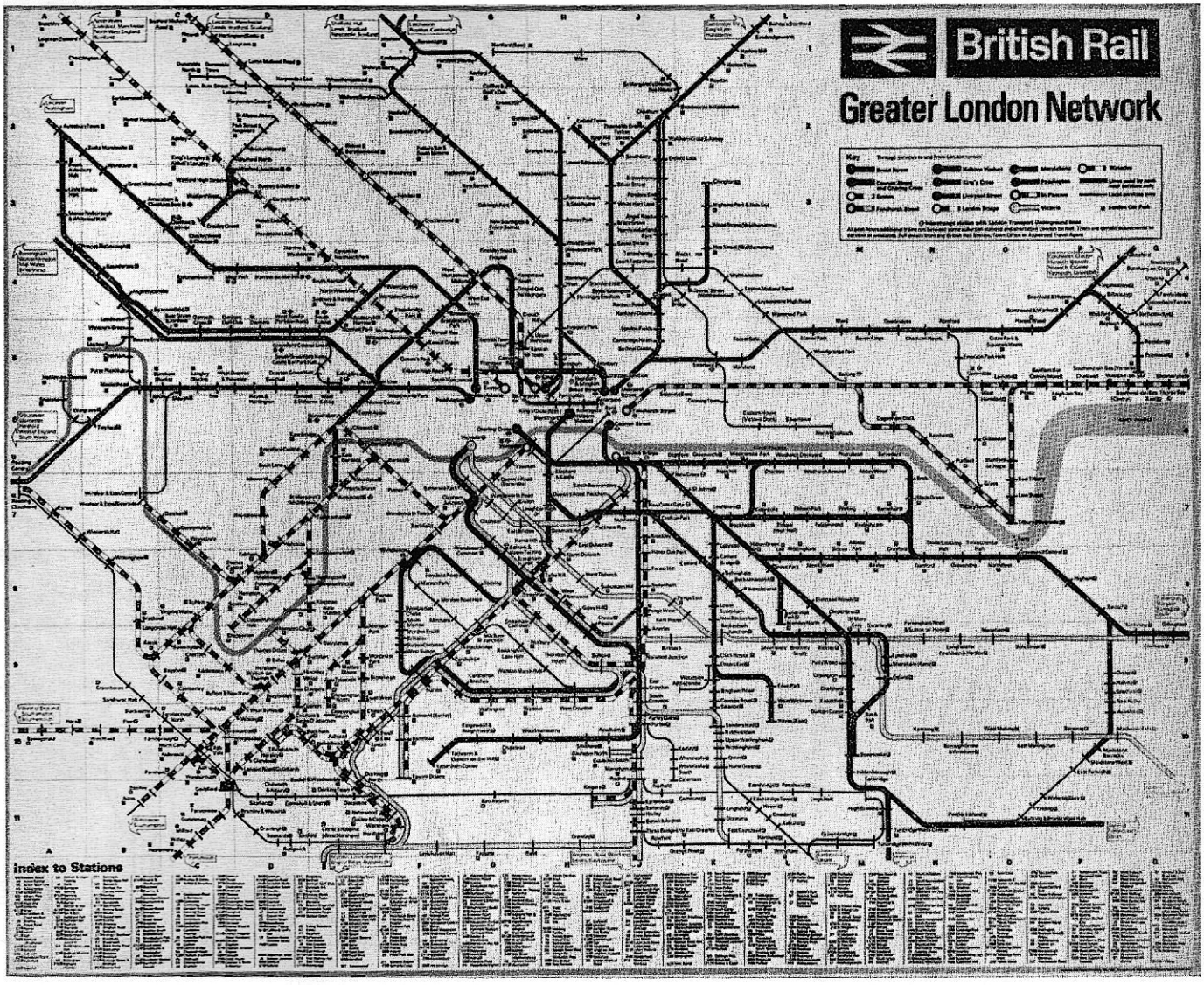
Future promotional material, therefore, is likely to pay much more attention to information. There will be less prestige publicity for a vague, overall image of rail travel. Propaganda will concentrate on specific services in relation to selected markets. And it will be careful to talk the language of the particular market to which it is addressed.

Thus separate campaigns will be mounted to sell sleeping-car services, Pullman services, car-carrying services and express services on selected routes. It is intended to associate key colours and "brand names"—East and West Coast, North-to-West, for example—with many of the principal routes and imprint them on the public mind through consistent use on all British Rail publicity. A diagrammatic representation of Britain has been devised for standard use in a great deal of this service-selling by routes.

BR displays at exhibitions, in large stores and so on, are likely to become more widespread—and more competitive for attention with the lavish efforts of private industry. Instead of design mock-ups adapted for display purposes, they will tend more towards showpieces specially designed for the job.

Of all its services, the BRB seems particularly keen to sell sleeping cars to a new market. It is conscious that the bulk of the present market is middle-aged and therefore liable to decline steadily. Its sights are on the young and upcoming executive, by instinct an air traveller, who might be a regular second-class sleeper passenger for both business and pleasure if he had any idea of the kind of accommodation BR now offers. A considerable potential for family sleeper travel is seen, because of the special attraction for children—but again, the ground must be prepared with an attractive briefing on all the facets of travel by BR night train.

Future promotion for sleeping-car services, therefore, is likely to be much more comprehensively informative than hitherto. It will range not only over the trainboard components of the service, from comfort to refreshments, but all the facilities on offer at terminals. It will make the point, for example, that at many sleeper terminals passengers there is a nearby BT hotel where passengers can get either breakfast, a bath, or both after they have detrained. In connection with all rail travel, more publicity is to be given to the shopping and other facilities at main stations. As yet, unfortunately, these are often meagre by comparison with the bright shopping arcades that integrate so many Continental city stations with the community. Can one hope that these new publicity ideas will stimulate a more enterprising approach to the development of stations in Britain?



The Dowty wagon speed control system

—an outstanding British invention that cuts out marshalling damage and inefficiency

BY the end of July British Railways should be operating a small yard where wagons are sorted into their appropriate reception sidings without propulsion from any locomotive. This will be the secondary yard of the immense Tinsley marshalling yard at Sheffield, which is due to be fully commissioned by the end of July. It will be the first yard in the world to be comprehensively equipped with the Dowty Wagon Speed Control System, one of the outstanding breakthroughs in railway technology of this century.

For their primary sorting, incoming wagons will be propelled over the hump of the main yard by a diesel locomotive in the traditional fashion. But whereas in all previous yards wagons for secondary sorting have needed later removal by another locomotive, at Tinsley one of the 55 sorting tracks in the main yard is a through road to the secondary yard and wagons for the latter will be projected straight along it from the main hump, on over the secondary yard's knuckle and into the selected secondary sorting siding, entirely by the Dowty apparatus. The siding reserved for these through transfers to the secondary yard will be equipped with no fewer than 700 Dowty booster-retarders spaced at intervals throughout its length.

Fallibility of existing yard equipment

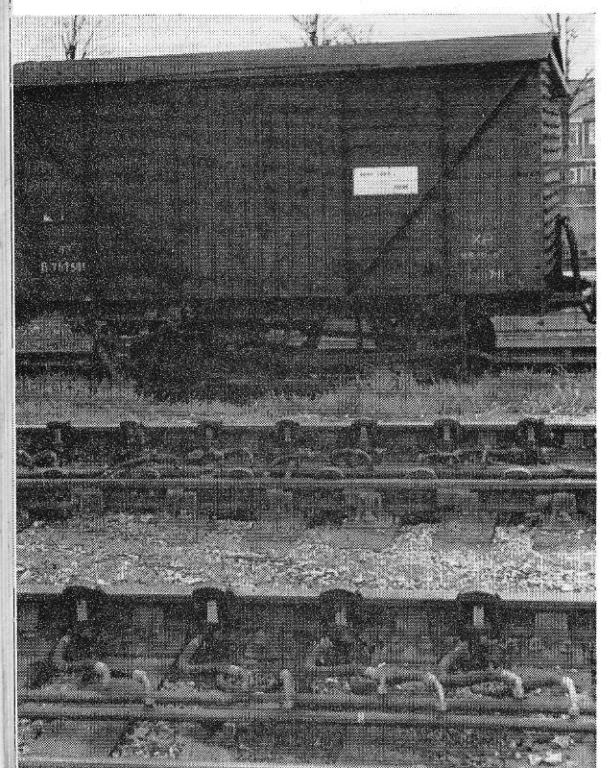
Since the last war, the development of automatic devices to measure the speed, weight and rollability of humped wagons and produce computed data for automatic operation of orthodox clamp-type marshalling yard retarders has been impressive. Nevertheless, because of the still widely varying characteristics of wagons forming a typical BR freight train, apparatus of this kind is far from infallible. In a day's work at one of BR's automated yards, an appreciable number of wagons are sorted into the wrong siding and have to be drawn out and remarshalled, because the speeds of successive cuts descending from the hump are too disparate; an occasional cut closes up on the one in front, with the result that both simultaneously occupy a key track circuit and the fresh route-setting which the first cut's release of the track circuit should actuate is not carried out.

In the sorting sidings, a proportion of wagons do not travel the full distance necessary to buffer up with other stock already in occupation of the road and from time to time a locomotive has to be brought over the hump to push down vehicles that have stopped short. In yards where control of the secondary retarders is left with the operators, this is sometimes due to understandable caution on their part, as a wagon derailed on the descent from the hump through insufficient retardation would be a far more disastrous mistake.

A year or two ago, a paper discussing these operational drawbacks in modern yards was read to an audience that included Mr. P. E. Checkley, the Chief Engineer of Dowty Mining Equipment Ltd. (Railway Division). It prompted him to study the potential use of hydraulic buffers for retardation. Initial experiments showed that by this means an efficient continuous control of moving wagons could be achieved and that, on down gradients, separation of cuts at specific intervals was possible. It was soon realised, however, that propulsion was needed to maintain the pace of slower wagons and connection of the apparatus to a pressurised oil system was found to be a feasible method of securing the boosting effect. Further thought evolved a unit that combined sensing the speed of a passing wagon with subsequent boosting or retarding to raise or lower its pace to the required level.

Three BR yards will have the new system

After successful experiments with a variety of wagons on a test installation at Dowty's Ashchurch works, the new device was first offered to the North Eastern Region of BR, as it was about to embark on four new concentration yards in its freight rationalisation programme. The NER management



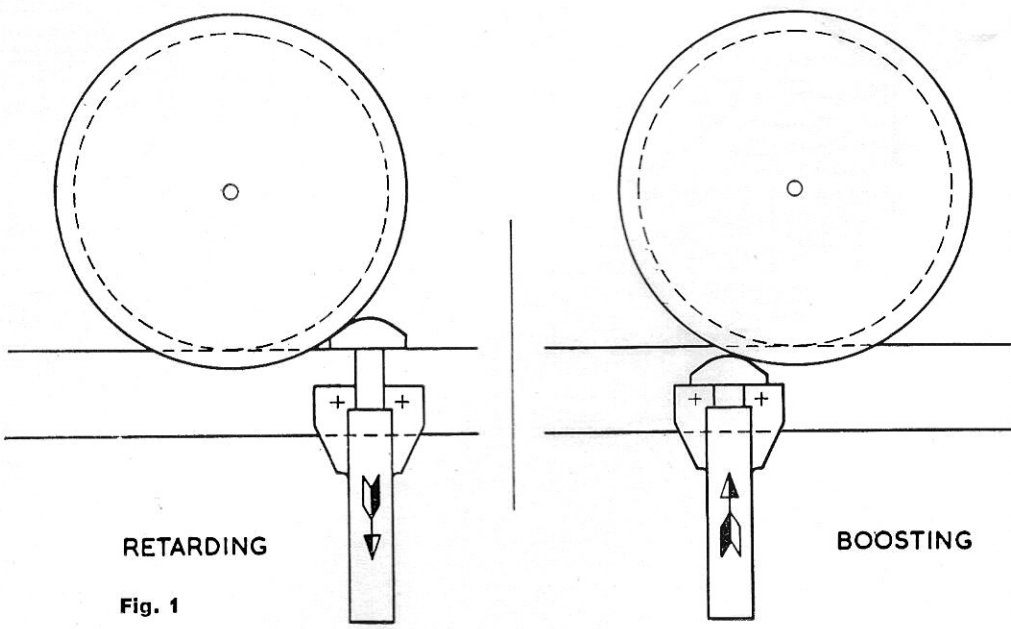


Fig. 1

was immediately impressed and agreed to a test installation on two sidings of its Hull Inwards marshalling yard. In this initial BR application, the Dowty apparatus was used only to regulate the pace of wagons once they had entered the two selected tracks after descent from the hump, which remained fitted with orthodox clamp-type retarders.

Mass production of the Dowty equipment in time for incorporation in the NER's major yards proved impossible, but demonstrations at Hull to high officers of the BRB and the management of other Regions stimulated keen interest. The Eastern Region soon ordered the first large-scale application of the Dowty Wagon Speed Control System for its new Tinsley yard, in preparation for which a second trial application was arranged at Goodmayes yard, on the GE main line; the conditions in which the apparatus was to work at Tinsley were simulated as far as possible at Goodmayes, where the hump was re-graded to the proportions planned for the Sheffield yard. At Goodmayes, control by the Dowty apparatus was for the first time extended right up to the crest of the hump. The ER also plans to use the Dowty apparatus in its new yard at Scunthorpe, while the LMR has ordered it for the 26-siding yard at Bescot, in the West Midlands, which is due to begin operation this autumn.

Method of operation

The design of the Dowty equipment and its method of operation was fully described by Mr. Checkley himself, in a paper to the Institution of Railway Signal Engineers at the beginning of December, in this fashion. Hammer-headed hydraulic units incorporating a speed sensing valve (which is set to the desired speed control value) are bolted to the inside of the running rails and act on the flange of the vehicle wheels. The units either: (a) retard the forward motion of a vehicle by exerting an upward force, as the head is being depressed towards bottom dead centre; or (b) boost forward motion by exerting an upward force during the piston's return from bottom dead centre (see Fig. 1). By this means an amount of energy is transferred to or from the vehicle, depending on whether it is travelling at above or below the critical speed. Hence, over a stretch of track with units installed at the required intervals, the apparatus will as necessary accelerate, retard, or keep passing vehicles steady at a desired average speed.

There are basically two types of unit. First, the retarder (Fig. 2) is a self-contained unit, partially filled with oil. It will not give energy, but only remove it. If the speed valve is set to control vehicles to, say, 4ft per sec, any vehicle travelling at just above that speed will be retarded and the amount of energy removed will be constant irrespective of that speed. Rapid depression of the piston by a wheel flange causes oil to flow through a speed valve and consequently creates a pressure difference across it. This lifts the speed control valve against the spring and seals off the orifices in its periphery against the valve stop.

Further increase in pressure, due to piston movement, opens the relief valve, allowing oil to pass out through the holes in the side of the speed control valve. This dissipates energy from the wheel flange because of the effort required to force the oil through the relief valve. After the wheel has passed, the piston extends at a rate controlled by the gradually rising contour of the wheel flange, by which time the relief valve has closed. An outstop holds the piston when it is fully extended.

Should a wagon be travelling at less than the desired critical speed (4ft per sec) when its wheel flange contacts the retarder, the piston moves down, but the pressure rise is insufficient to lift the speed control valve against its spring load and the oil escapes through the peripheral orifices of the speed control valve. Thus the unit is depressed but does not reduce the wagon's speed.

The booster-retarder

The booster-retarder unit (Fig. 3) needs a low- and a high-pressure oil supply line. It decelerates a wagon in the same way as the retarder, but if any passing vehicle is travelling below the required speed of 4ft per sec there is no retarding action. Oil is discharged into the low-pressure line. High pressure is then introduced into the unit at bottom dead centre and is maintained during the upward stroke.

Rapid depression of the piston by the wagon wheel flange causes the displaced oil to flow from the main cylinder to the low-pressure line, which closes the speed control valve. This prevents further flow to the low-pressure line and the pressure below the piston rises instantaneously to a value slightly higher than the high-pressure line. A clack plate opens and continuing depression of the piston forces oil into the high-pressure line, creating a high resistance to downward travel and extracting energy from the moving wagon, but storing it in the system.

When the piston starts to ascend the fall in pressure within the unit allows the speed control valve to return to its normal position. Oil from the low-pressure line charges the unit via the speed control valve orifices and the check valve in the centre of the valve stem. High-pressure oil cannot be admitted into the unit because of the position of the trip valve sleeve. The valve stem return spring prevents the valve stem depressing into and closing the speed control valve when the unit is being refilled. As the piston extends, the collapsed plunger extends and the body is refilled with oil via the check valve in the centre of the plunger, so that the unit becomes fully filled with oil and ready for the next operation.

If a wagon is travelling at less than 4ft per sec, the unit

Extreme left: Dowty wagon speed control system equipment installed in Hull Inwards Yard. *Photo by Modern Railways*

Fig. 1 The basic principles of action of a Dowty wagon speed control unit.

Fig. 2 A cut-away diagram of the retarder unit in its static condition, or with a vehicle wheel just making contact.

Fig. 3 A cut-away diagram of the booster-retarder in its static condition, or with a vehicle wheel just making contact.

Diagrams by courtesy of The Institution of Railway Signal Engineers

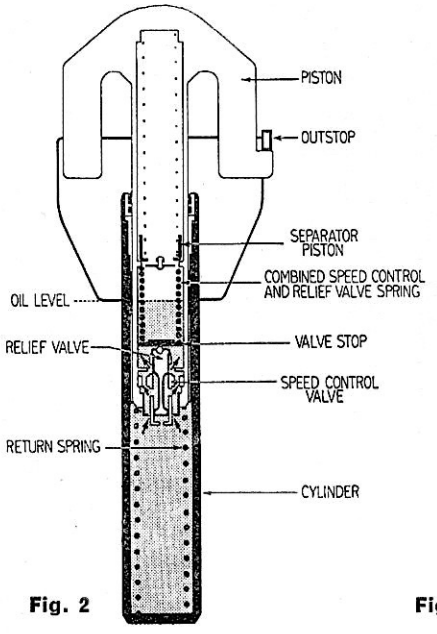


Fig. 2

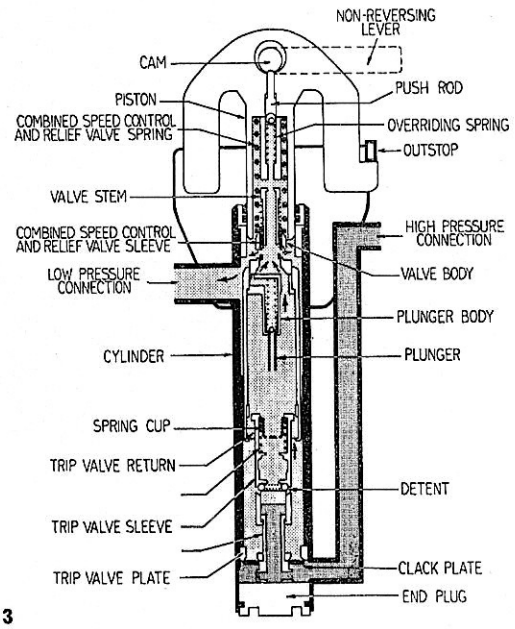
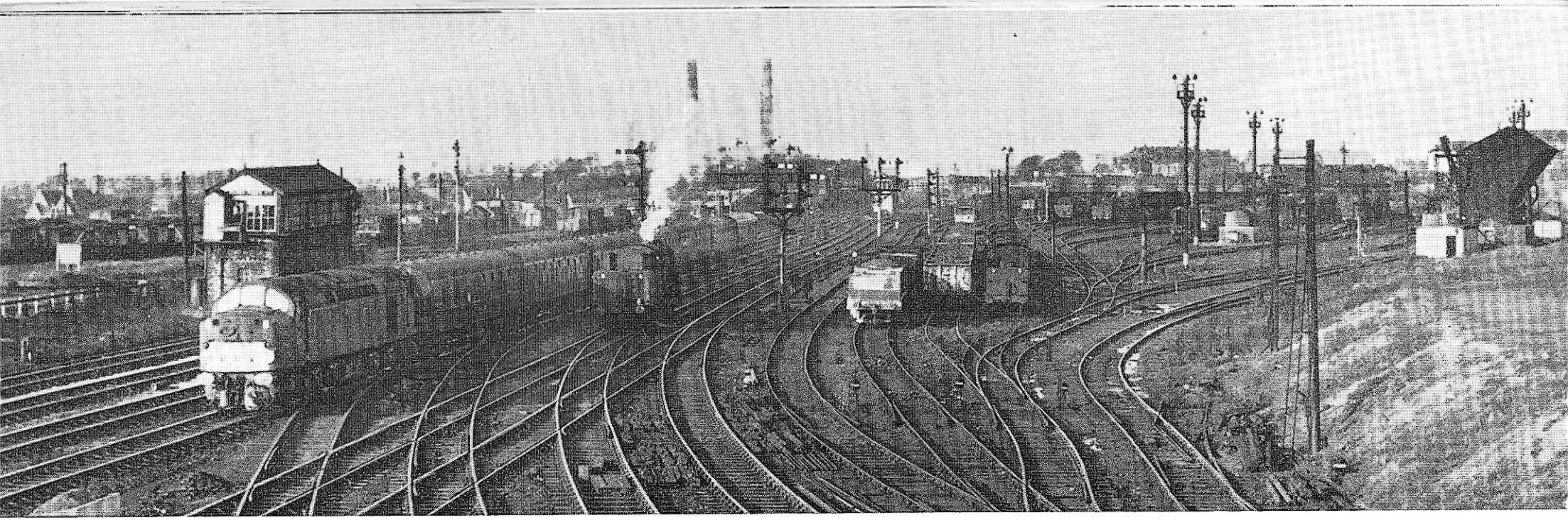


Fig. 3



Will this be the area of another Dowty-equipped yard? As discussed on page 62 of this issue, the LMR is anxious to replace a number of small yards in the Wigan neighbourhood with a new concentration yard. These pictures were taken **(above)** at the south end of Springs Branch motive power depot, with an up express on the main line headed by an English Electric Type 4 diesel; and **(below)** at the north end, with another English Electric Type 4 diesel heading a down parcels train.

Photos by C. T. Gifford

boosts its speed. As the wheel flange depresses the piston, the displaced oil escapes from the main cylinder to the low-pressure line via the orifices in the speed control valve. The oil flow is insufficient to close the valve against its spring force and the piston is depressed at low pressure, which offers little resistance to the wagon. Because the speed control valve did not lift, oil remains trapped inside the plunger body, causing the plunger and body to act as a strut when it strikes the spring cup.

A plunger makes contact with the spring cup near the bottom of the piston travel and depresses it until it bottoms on the trip valve sleeve, which is mechanically moved until the detent is disengaged. The trip valve spring then "fires" the trip valve sleeve down into boost selection, where the ports on the trip valve sleeve coincide with those on the valve stem. High-pressure oil is now admitted into the unit and immediately closes the speed control valve, exerting full force against the wheel of the wagon. Finally, the high-pressure supply is cut off as the trip valve sleeve is lifted by the trip valve return during the last fraction of upward piston travel.

A non-reversing mechanism has been included to prevent wagons being accelerated backwards after recoiling from wagon rakes in the sidings. If it starts to travel in the reverse direction, the wagon wheel depresses the non-reversing lever prior to depression of the piston. This rotates the cam and depresses the push rod, which in turn depresses the valve stem via the overriding spring. Depression of the valve stem closes the orifices in the speed control valve and causes an instantaneous rise in pressure when the piston is contacted by the wheel. High pressure within the unit then lifts the speed control valve and valve body on to its stop and also lifts the valve stem on to its stop against the action of the overriding spring. The unit then completes the normal retarding cycle, resisting any reverse movement of the wagon.

Earthworks of a yard are reduced

The advantages of the Dowty system by comparison with conventional retarders controlled by the latest electronic means lie far more in the greater operational efficiency achieved in day-to-day working of a yard than reduction of first cost. Nevertheless, adoption of the Dowty method at Tinsley has resulted in constructional economies, particularly because the hump did not need to be so steeply graded.

The design of a new yard in which it is intended to install the Dowty Wagon Speed Control is a very precise exercise, on which computers are employed at the BR Engineering Research Centre at Derby. The object is to strike an economical balance between gradients and curvature on the one hand and the necessary number of Dowty units on the other. Obviously, the more gradients can be made to accelerate the descent of wagons from the hump, or retard them as they enter the sidings, and the easier the curves can be made, so that they do not brake the wagon's progress down the sidings, the fewer the Dowty units that will be needed. (As a matter of interest, the equipment of Tinsley yard is requiring approximately 26,000 units and about 30 miles of piping to maintain the low- and high-pressure supply lines to the booster-retarders).

Moreover, the precision of the Dowty system increases the throughput of the yard by comparison with previous methods. The original specification for Tinsley yard pre-supposed a throughput of 4,500 wagons every 24hr (since reduced to 4,000). It is thought doubtful that orthodox clamp-type retarding equipment would have achieved this, even with fully automated controls.

The layout of a marshalling yard has four key areas: the acceleration section below the crest of the hump; the switching area, where cuts are routed to their selected siding; the retardation section, the entrances to the sorting sidings where the wagons, having cleared all switches, need to be reduced to a safe impact speed as soon as possible; and the sidings themselves. A train to be sorted is propelled over the crest of the hump at about 2ft per sec. The task of the Dowty apparatus is to quicken the descending cuts as soon as possible to 12ft per sec in the acceleration section, which is a desirable speed to ensure adequate separation in the switching area, then to bring the cuts down to a steady 4ft per sec, which is a safe buffering speed that will damage neither vehicles nor their contents when they make contact with other stock already in their appointed siding.

To secure this fine speed control, the range of likely wagon weights and rolling resistances that will be encountered in the yard must first be assessed. This, in association with data on gradients and curves, will determine the number of retarding and booster-retarding units required and their spacing. In the acceleration and switching areas, the main object is to sustain a steady speed of 12ft per sec and maintain accurate separation of wagon cuts. In the switching area, there is a great deal of pointwork where the Dowty units cannot conveniently be installed; to minimise speed variation over these sections, the units can be spaced at a high density immediately before and after them. In the retardation section, deceleration of the wagons to a safe impact speed can either be secured by Dowty units alone, or by a combination of Dowty units and a slight up gradient, which will obviously economise in the apparatus. The risk of wagons fouling each other during retardation in adjacent sidings can be avoided by the use of units with a higher speed setting—for example, 8ft per sec—in the early part of this section.

Proof of shock-free marshalling at Hull

The density of units needed to keep the wagons moving steadily down the sidings at 4ft per sec is not high. It is unnecessary to install any units in the last 200ft or so of the siding; any wagon that stops short on this final stretch will gradually be pushed to the far end as the siding fills up and ultimately all wagons on that track will be bunched up ready for coupling without the aid of any locomotive to push them down. Of course, wagons will tend to rebound after buffering up, but this will be corrected as successive wagons make contact; and the energy imparted to later wagons entering that track and buffering up within the area of the Dowty units will sustain the bunching process. This was satisfactorily demonstrated at Hull, when cuts of wagons equipped with the Dowty automatic coupler were successively sorted into the siding equipped with the Dowty Wagon Speed control system and a complete train was coupled up in the sorting siding without any human intervention.

Other evidence of the Dowty Wagon Control system's efficiency noticed at Hull was that no coal was spilled from loaded wagons sorted into the two sidings which were Dowty-equipped; in other sidings, it was a periodical necessity to shovel up spillage from loaded coal wagons that had buffered up too fiercely. As for efficiency of separation, records kept at Goodmayes have shown that the average of mis-shunts is only three a week, which is far lower than in any yard with clamp-type retarders and any existing method of retarder control.

During the initial experiments with the Dowty Wagon Speed Control at Hull one heard some scepticism about the durability of the Dowty units under the constant battering of wheel flanges. During the past few months the design of the units has been substantially improved and Dowty are confident that those coping with the lower speeds will have a life of at least 10 years. Insufficient experience has been acquired so far with the high-speed units, employed in the acceleration and switching areas, to make a useful prediction of life expectancy, but the heads have been satisfactorily tested on Dowty works rigs at up to the equivalent of 10m cycles of operation.

Development promises easy maintenance

Current Dowty development work is concerned with a monolithic type of unit, in which the heads are welded to the unit's piston. It had been hoped to install 2,000 of these in the hump area at Tinsley, but a production line cannot be set up in time. A test installation of these monolithic units has been made at Toton, where they have performed very satisfactorily, although working in conditions more exacting than those for which they are designed. The end vehicles of the long rakes of loaded coal wagons that are humped at Toton often strike the Dowty units at 17–20 m.p.h., instead of the 8 m.p.h. to which the cuts would be restricted if the hump were thoroughly equipped with Dowty apparatus, and the heads are therefore taking a heavy pounding.

The manufacturers concede that units in the acceleration and switching areas of a Dowty-equipped yard will need more frequent renewal than those in the sidings. However, because of their oil content the units should be susceptible to very little internal wear and reconditioning with a new piston

and head should be practicable in many cases where units become worn. The possibility of developing a loose head is under study and some prototypes are already on test. If trials are successful, it may be possible to limit maintenance of the units in heaviest use to an exchange of heads.

No special difficulties are foreseen in keeping the apparatus workable during the winter. The constant circulation of oil in the system will generate heat sufficient to prevent any failure to function through freezing; it might even be adequate to thaw snow or ice forming on the hammer-head of a unit. The only condition likely to impede successful working in Britain is deep snow, which would hamper all railway operations to the same extent.

Overseas interest is lively

Overseas interest in the Dowty Wagon Speed Control system is already considerable. Canadian National Railways have some units on test and enquiries have so far come from India, China, three railways in Australia, Spain, Norway and West Germany. A consideration involved in the export of the Dowty device is that initially it was designed to work with bullhead track, which has been or is to be laid in the British yards scheduled for Dowty equipment. The wider base of a flat-bottomed rail requires the Dowty unit to be fixed further away from the railhead, with the result that wheel flanges exert greater stresses on its head. For export, therefore, some redesign may have to be undertaken.

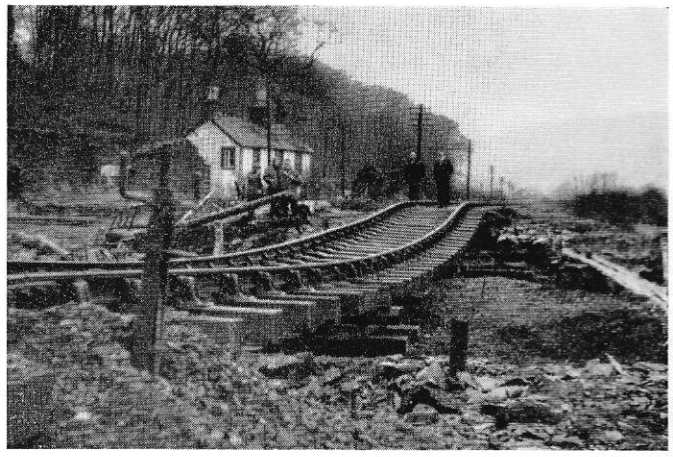
The manufacturers have also had enquiries from industrial users, particularly some collieries. One potential use on a colliery layout is the maintenance of a fine speed control of wagons passing through a washery. Standard Dowty units would be installed to move wagons into the washery, but then special units would be laid on the track under the washery to restrict the vehicles' speed to the low level necessary to secure uniform, optimum loading of the wagons' capacity. Finally, more standard Dowty units would take control of the wagons as they left the washery and distribute them to the sidings. A number of possible applications of the Dowty system to steelworks' layouts are also foreseen.

Dowty emphasises the wide-ranging help and encouragement they have received from British Railways in the development of their device. It is unfortunate that its evolution came too late for the apparatus to be comprehensively applied to more than the last two or three new yards British Railways are likely to install, in view of the new concepts of freight working, but in many existing yards application of the Dowty system to sidings would greatly improve vehicle control and enhance operational efficiency. Additionally, it should very significantly lower the damage to wagons and their contents resulting from the marshalling shocks which still cost BR very dearly every year.

FLOODS CUT OFF THE CAMBRIAN COAST

An Act of God anticipated two closures —and the only line it left intact had already been closed

Mark Bourne



THE last word on two bitterly contested Welsh rail closures was pronounced neither by Minister of Transport nor the opposing All-Wales Committee, but by torrential rain on the night of December 12–13. This washed away the track of the Ruabon–Barmouth line, which had been scheduled for closure on January 16, and of the Carmarthen–Aberystwyth line, also due for early closure. Two viable lines, the Shrewsbury–Aberystwyth/Pwllheli and the Llandudno Junction–Blaenau Ffestiniog, were also severely damaged. Ironically, the one line to the Cambrian Coast that was left intact, the Caernarvon–Afon Wen, had been statutorily closed seven days earlier.

The flooding was the worst on the Cambrian system since November, 1929. This time damage was less severe, but more widespread. Thanks to ebb-tides, coastal damage was slight. Damage to the Blaenau Ffestiniog branch was largely confined to two landslips, although it was deeply flooded for the second time in a week. The most severe damage was done to the lines awaiting closure. The Ruabon–Barmouth was breached 2 miles east of Bala and very severely on either side of Dolgellau, where half a mile of track was washed away, and the Carmarthen–Aberystwyth line was swept away for some distance at Llanilar. Service was not restored on these lines, so that their closure dates must be written as Saturday, December 12, 1964—by Act of God.

The flooding followed a week of rain, culminating in a torrential Saturday. In eight days Blaenau Ffestiniog had recorded 18½in of rain, with 5.14in on the last day. On the night of December 12, both the 18.00 Aberystwyth–Shrewsbury mail and the 18.45 Shrewsbury–Aberystwyth passenger were halted and turned back by floods. By dawn, large sections of line had been swept away.

As floods on the roads subsided, a special shuttle service of buses spanned the 22 miles between Tregaron and Aberystwyth, while the breach in the Cambrian was covered by a similar 71-mile service between the last intact railhead, Welshpool, and Aberystwyth. Dieselisation made a modest Cambrian debut on December 14 when Metro-Cammell two-car units ran a rail shuttle-service between Shrewsbury and Welshpool. Mail, milk, papers and parcels for the stricken area were all dealt with at Welshpool by extra motor transport.

The first objective was to restore the line to Machynlleth and the District Engineer, Shrewsbury, sprang into immediate action. At dawn on December 13, the Welsh Sabbath notwithstanding, the flooded track was inspected on foot. By noon repair trains had been loaded; and by dusk the first breach east of Machynlleth—100yds of washed-out track—was being packed. The following afternoon, Class 4 4-6-0 No. 75002 was successfully tried over the breach, which was then ballasted in. The line was opened to freight as far as Machynlleth on December 18.

The most serious breach in the viable lines occurred on the Derwenlas curve, 2 miles east of Dovey Junction (*see illustration*). Here the line short-cuts a bend in the river Dovey on an embankment, with a built-in three-span timber bridge to relieve flood pressure. Two years ago this was replaced by three Armco 6ft diameter flood-ports, revetted in stone. The exceptional flood first swept over the track higher up then, laden with logs from a sawmill, bottle-necked at the ports. The embankment, including revetment, collapsed at this point, leaving 200yds of track switchbacking in space. This required extensive jacking, infilling and rebuilding. But only nine days after the disaster traffic was restored to the whole system.

accident report

BR safety in 1963

A REDUCTION in the total number of train accidents for the first time in four years, and a marked decline in the number of casualties arising from railway accidents—these were the particularly gratifying features of the 1963 Annual Report by the Chief Inspecting Officer of Railways, Col. D. McMullen, on railway accidents (*HMSO* 6s 6d). The total number of fatalities in train accidents was 28 compared with 33 in 1962; of this total 15 were occupants of cars involved in level crossing collisions, 12 were railway staff and only one was a passenger. The one passenger fatality occurred in the derailment at Liverpool Street on December 13 and represents a rate of one fatality in 1,466m passenger journeys.

After rising for three years, the total number of train accidents fell from 1,348 in 1962 to 1,300 in 1963. The downward trend in the number of significant accidents—that is, those of a potentially dangerous type—also continued; a rise in the number of freight train collisions and derailments was offset by a fall in the number of similar accidents to passenger trains. However, while the accident rate per million train miles fell in 1963—although it is still higher than the rate for the years 1948–61—the rate of significant accidents has varied little during the last decade, despite a fall in train mileage.

For the second year in succession there has been a decline in the number of accidents caused by drivers passing signals at danger—the lowest since the war—which Col. McMullen attributes in part to the rapid extension in recent years of colour-light signalling and AWS. The Medical Research Council's committee, established to investigate the human factors underlying the passing of signals at danger, has completed the analysis of its statistics and is preparing a report. As reported in more detail in the January issue, BR is conducting experiments with a new type of driver's safety device (formerly known as the dead man's treadle), which is combined with a vigilance control.

Accidents caused by signalmen's errors rose during 1963 to 44, against the falling trend of previous years, and the signalman element in accidents caused by combined signalmen's and drivers' errors was also higher. Col. McMullen stressed that accidents arising from irregularities in block working, as at Knowle & Dorridge and between Desborough and Glendon, underlined the importance of good and intelligent supervision.

A disturbing feature is the considerable increase in the number of accidents arising from technical defects on locomotives from 49 to 122, of which no fewer than 90, compared with 35 in 1962, were fires caused by ignition of oily dirt on diesel locomotive bogies and on diesel multiple-units. It is noteworthy, said Col. McMullen, that of the 45 locomotive fires, two-thirds occurred on BR/Sulzer Type 4s, the bogies of which are particularly difficult to keep clean. Although more stringent steps have been taken to prevent fires, by September, 1964 the total had already exceeded that for the whole of 1963.

Col. McMullen strongly condemned malicious acts of hooliganism by the public, which resulted in no fewer than 50 train accidents in 1963, including one derailment. He observed that if the deliberate placing of objects on the line or other interference with railway working continues, it can only be a matter of time before there is a serious accident. He emphasised that the public as a whole, and particularly parents and education authorities, could help to check this kind of behaviour.

There was a sharp increase for the second year in the number of broken rails. Particularly disturbing was the amount of flat-bottom rail failures in electrified areas where electric multiple-units are predominant. On the ER, for example, the number of rail failures was 49, of which 26 occurred on GE electrified lines, and the incidence of broken rails on the SR is about double the average for British Railways as a whole, which is 0.6 per million train miles; the lowest figure—0.3 per million train miles—is found on the WR, which does not operate electric trains.

Accidents at public level crossings fell although the number of fatalities rose slightly to 11. There was no progress in the installation of automatic half-barriers, but Col. McMullen added that a start was made during 1964 to speed-up the introduction of this type of protection. A welcome reduction in the number of accidents caused by derailments of short-wheelbase four-wheel vehicles was largely due to the special attention given to the matter and to the introduction of a 50 m.p.h. speed limit on all freight trains including such vehicles.

The decline in safety during 1962 had continued into the early part of 1963, due, no doubt, to the severe winter weather, but the position had improved as the year progressed with the result that the final figures, both in the number of train accidents and the rate per million train miles, show an improvement on the previous year for the first time for some years. There is evidence of a distinct improvement in the morale of staff at all levels, which Col. McMullen attributes to the general "new look" which BR are acquiring, to a better understanding of their problems by the public, and to the many technical improvements brought about by modernisation. Improvements in service conditions and in BR's financial position are also factors in the better safety record, but morale is the most important of all the tangible factors that go towards the efficient and safe running of a railway.

Accident at Nantwich LMR

The driver of an express passenger train which passed a signal at danger and collided with a car and a lorry at a level crossing at Nantwich on the Shrewsbury–Crewe main line on June 25 last is held responsible for the accident by Lt-Col I. K. A. McNaughton, the Inspecting Officer, in his report (*HMSO* 1s). One of the car occupants died from injuries and the other was seriously injured, but the lorry driver was only slightly hurt.

The train involved in the accident, the 6.35 Plymouth–Manchester, was hauled by a double-manned Brush Type 4 diesel. The Shrewsbury–Crewe line is joined about 600yd south of Nantwich station by the branch from Market Drayton, the junction of which is controlled by Market Drayton Junction signalbox. Between Market Drayton Junction and Nantwich station the line is crossed by two level crossings: Shrewbridge Lane, about halfway; and Wellington Road, adjacent to the station. The former is controlled by a crossing box which is not a block post, although levers in the box operate slots on the running signals worked by the adjacent signalboxes. Wellington Road crossing, the site of the accident, is controlled by Nantwich Station Crossing signalbox. A further crossing about ¾mile on the Crewe side of the station is controlled by Newcastle Crossing signalbox.

Wellington Road crossing is protected by Nantwich Station Crossing down No. 1 home signal, 25yd from the gates; Nantwich Station Crossing down inner distant is a lower arm under the Market Drayton Junction home signal 761yd from the Nantwich Crossing home signal; and the outer distant, a normal single arm signal, is 1200yd from the inner distant. The line is not equipped with AWS. The signalling controls provide a "line clear" release from Newcastle Crossing on the Nantwich Station Crossing down starter, and the normal interlocking and slotting between the various signalboxes means that the Nantwich Crossing down outer and inner distants can display a "clear" indication only when the appropriate signal levers in Nantwich Crossing, Shrewbridge Lane Crossing and Market Drayton Junction boxes have been cleared.

On the day of the accident a number of trains passing in both directions had led to an accumulation of road traffic on Wellington Road. The Nantwich Station Crossing signalman had accepted the express with the crossing gates open to the road, as he was entitled to do, since crossing gates do not form an obstruction within the meaning of the block regulations. The express approached sooner than the Nantwich Station Crossing signalman expected; he was waiting for an opportunity to close the gates when he saw the train approaching at speed, but was unable to move the gates because of the traffic. The train ran through the gates at about 35 m.p.h. carrying with it a milk lorry, and sweeping aside a car which was crushed against a gate-post of the crossing.

From the evidence it was clear that the Nantwich Station Crossing home and distant signals were at danger and caution for the express and Lt-Col McNaughton holds the driver of the express responsible for the accident. But he adds that the signalman was ill-advised to open the gates after the previous train, since the express could not have been far away.

The express driver claimed that smoke and steam from a passing freight train obscured his visibility. He was looking out for men working on the line and did not see the inner distant signal because of the drifting smoke. He was also surprised to find that a permanent way speed restriction near the crossing had been raised from 20 to 50 m.p.h. He saw the crossing home signal at danger from about 300yd, but was unable to stop in time.

Lt-Col McNaughton observes that the 30 miles of line between Shrewsbury and Crewe, although forming a link between two important main lines, are not provided with AWS, which might have prevented the accident. He recommends that consideration should be given to its installation on this section and to the provision of lifting barriers at the crossing when the present equipment needs renewal.

The Bishopsgate goods depot fire

The operational after-effects of British Railways' most costly single disaster were quickly overcome by smart improvisation. Whether the depot will ever be rebuilt on its old site seems doubtful—in fact, the fire may have drastically solved a BR problem

BRYAN MORGAN

THE flames which rose over the Eastern Region's Bishopsgate goods station in the dawn of Saturday, December 5, 1964, were claimed to be visible 10 miles away. They marked the site of perhaps the most destructive fire which East-Central London had known in peacetime, and possibly the costliest single incident ever to affect the railways of Britain.

The Bishopsgate depot was built about 1850 as the passenger terminal of the Eastern Counties lines. It was an impressive building for so small a system and much of the original structure was destined to survive the years. But with the formation of the Great Eastern Railway in 1862 the station began to appear inadequate and in 1874 passenger traffic was moved to a new terminus at Liverpool Street—a quarter of a mile south and just within (as Bishopsgate was just without) the limits of the City of London. In the decade which followed Bishopsgate itself was rebuilt as a goods depot and took the form which was to endure for over 80 years, with a storage basement below the train-shed and a warehouse floor above it. In addition there was generous office accommodation at the west end, fronting on Bishopsgate itself, and an independent marshalling yard.

The depot's business was growing

Over the years the volume of goods passing through the station fluctuated, but in general the curve was an upwards one. From 1960 onwards had been a particularly busy period for the depot. This was because there had been added to the carriage of the varied produce of East Anglia (and, to a lesser degree, of the North-East and even Scotland) into the City and East End, and a corresponding return traffic in London's own products, an increasingly important Continental traffic. By BR ferry wagons and containers, and by transhipment from ships berthing at Parkeston Quay, freight was being exchanged with Russia, Iran, Turkey and every country in Europe except those which naturally used the SR Channel ports. This important export trade, together with home goods traffic recently displaced from closed stations in the Lea Valley, had been accommodated by reorganisations rather than rebuilding at Bishopsgate.

December 5 was a fairly average day for the depot. The pre-Christmas shipments of goods in bulk had ended and the last-minute rush of sundries and perishables was not yet under way. At 06.00 the comparatively small night staff of a week-end was coming off duty. And it was one of these who reported an outbreak of fire in the buildings adjoining the tracks at the west end of the main level of the depot.

How the fire started remains—at least so far as public knowledge goes—a mystery. It is not even clear why it spread so quickly, though the open tunnel shape of the train-shed, the widespread use of wood in the old buildings, a light westerly wind and the inflammable nature of the freight stored—dairy produce and plastic goods rather than earthenware and iron castings—must all have been contributory factors: there had, in fact, been two minor fires on the premises in the autumn of 1964. What is certain is that within minutes the fire had spread to the full length and height of the main floor, the upper warehouse, and most of the offices. (It was on the top floor of this block that two duty Customs men, stationed at Bishopsgate for the examination of Harwich traffic, were trapped and died.) Only the vaulted, brick-built basement and a few outlying offices had any hope of survival.

Nor was it the goods station alone which seemed in peril. The fire showed signs of endangering not only a 2,000-gallon petrol storage tank and other neighbouring buildings, but the main-line tracks to the west. Accordingly, at 06.33 the ER took the precaution of closing Liverpool Street station to all traffic. Most of the 200,000 commuters through the busiest passenger terminus north of the Thames were fortunate in that the disaster occurred on a Saturday; those who had to work, and long-distance travellers too, could transfer at Stratford without intolerably over-loading the Central Line. Freight trains bound for Bishopsgate were garaged in the comparative safety of the marshalling yard until arrangements for re-routing could be made.

67 appliances and 300 firemen

Meanwhile the Metropolitan fire brigade was on the scene with 67 appliances—said to be the largest number assembled at one point since air-raid days—and 300 men. After nearly 5hr of work the fire could be regarded as under control. But smoke was still rising from the buildings 60hr later. Even after five days isolated pockets of flame were being discovered.

From the public viewpoint, the most obvious aftermath of the fire was the dislocation of Liverpool Street. On Saturday afternoon, experts expressed doubts as to the safety of a wall to the east of the passenger lines where mortar had cracked and brickwork might fall as it contracted: the danger was less of rubble striking trains and fouling points as of its bringing down overhead electrical wires. For nearly 36hr more Liverpool

Street had to be isolated; and on Saturday night, for the first time in railway history, the "Hook Continental" left from Stratford-atte-Bowe.

Fortunately Liverpool Street is not the busiest of terminals for long-distance trains and the normal Sunday schedules could be fairly comfortably handled from Stratford until, late that night, two of the six tracks into the terminus were pronounced safe. Sunday was also occupied by planning for the heavy suburban traffic which would re-commence the next day. It was considered that all expresses, and reduced local trains on the Bishop's Stortford and Hertford lines, could share the single up track into Liverpool Street with only slight delays. Southend Victoria would be served by Fenchurch Street; but trains to and from Colchester and Chelmsford, Clacton, Witham, Ilford and other commuter destinations would have to be turned round at Stratford or Hackney. And for access to these a fleet of buses had to be organised to supplement LTE transport in the rush-hours.

Monday's suburban traffic moved well

This system, which was aided by the establishment of a special passenger enquiry office, worked adequately. The hard-pressed suburbanite, perhaps, was more inclined to grumble at an extra change, an extra 10min of travelling time, than to appreciate the skilled improvisation which got him to and from his work more or less to schedule. But conditions improved steadily throughout the week, especially after the opening of a second track into Liverpool Street on Tuesday. And on Saturday December 12, exactly a week after the fire, all passenger services in the former GE area were working normally.

On the freight side, too, there had been triumphs of improvisation—triumphs reminiscent of wartime and, like those, owing much to the often-maligned duplication of facilities which was inherited by British Railways from their Victorian predecessors. An immediate overflow from Bishopsgate, for instance, was available a few hundred yards away at Spitalfields: Mile End was also called into service: and within 48hr of the outbreak arrangements had been made for freight to be divided between King's Cross (for home traffic), Stratford (for the ferry trade) and Lea Bridge (for other imports and exports). Special organisation dealt with the transfer of perishables such as fish from Parkeston Quay, parcels collections in the City were being resumed, and at Bishopsgate the goods office was at work again in emergency premises and another enquiry office, with five telephone lines, had been established to deal with the flood of enquiries concerning freight which might have been lost in the fire. During all these transitions, few of the 1,200-strong payroll of the depot had had to miss a single shift.

Meanwhile, teams were at work trying to identify goods from their labels and documents. This operation met with reasonable success, especially for wagonload consignments, but physical salvage proved a disappointing operation. Bishopsgate and most of its contents (which included some 150 rail wagons, 60 road trailers and a number of mechanical horses) had to be regarded as a write-off—a mass of twisted girders, charred wood and insecure, water-soaked masonry.

Extent of loss still unknown

Weeks later, British Railways were still reluctant to set a value on the station and its contents. Press estimates at the time ranged from £1m to £10m: The British Insurance Association hazarded at least £5m: and until and unless the railway authority is prepared to comment on this figure it must be regarded as a reasonable one, if erring on the high side. Even disregarding the worth of the temporary contents of the station—most of which were insured by their shippers—it is hard to see that Bishopsgate could be rehabilitated for less than a sum reckoned in millions of pounds. And inevitably this fact has led the speculation as to the wisdom of the policy of British Railways' carrying their own insurance.

Both before and after grouping, railways differed widely in their approach to this problem, with each insuring different categories of assets; it was only the rare, small company, however, which indulged in anything like a comprehensive coverage. Even when policies appeared to be wide-ranging, the premiums were kept within bounds by their inclusion of clauses under which the insuree remained responsible for not only the first fraction of a loss but all of it above a certain maximum. Had Bishopsgate been valued at £5m, for example, the railway authority might well have agreed to carrying the first £100,000 and any loss in excess of £1m.

This policy was continued in the early years of nationalisation, the general tendencies being to insure with consortia rather than individual companies and to reduce total coverage. Then, with the re-organisation of the British Railways Board three years ago, the decision was taken that the Board should carry its own insurance except in three cases—when there was a contractual obligation to insure (as with leased properties); when insurance rates were particularly favourable (for example, with ships, hotels and—rather ironically—staff flying on duty); and when there were exceptional hazards. No policy, in fact, has ever been taken out under the last category.

An acceptance of risks on this scale is indeed not uncommon either for government departments or for transport undertakings, few of which have assets on the vast and widely-spread scale which makes British Railways, in a sense, a naturally self-insuring body. Railway estates are currently valued at some £1,000m and rolling stock at about the same figure. If both these could be comprehensively insured at a premium as low as 1s/£100—less than half that of the householder's comprehensive policy—they would still account for an annual bill of about £1m.

BR's lack of insurance is justified

In fact, it is doubtful if British Railways' average losses from fire, flood and similar hazards have averaged more than £20,000 in the years since nationalisation. With thefts of railway property and the greater cost of vandalism included (but with, of course, the reckoning for such *coups* as the Great Mail Robbery left out), the bill might amount to £50,000: with crashes, compensation, etc., to £250,000. But even if the cost of the single and isolated Bishopsgate disaster is set at £5m—about one quarter of one per cent of the total assets of British Railways—averaged back over 20 years and added to this last figure, it is clear that British Railways have shown a notional profit of millions of pounds since the end of enemy action by carrying the bulk of their insurance risks themselves.

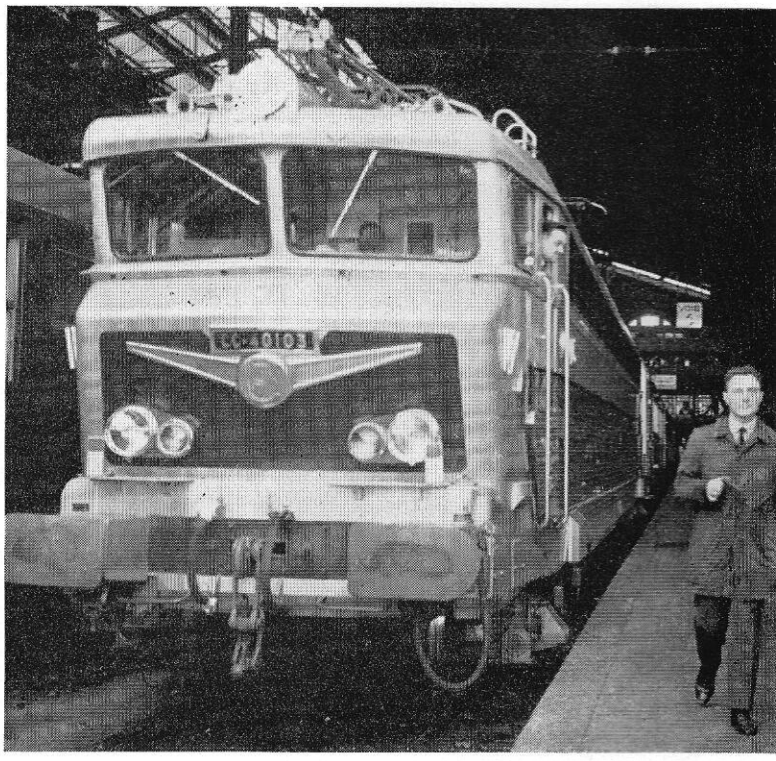
A final question remains: the future of the Bishopsgate goods station. The fact that the removal of its sundries traffic—important in terms of man-hours, but not of profit—to another depot was envisaged in the Beeching Plan (which did not otherwise specifically mention Bishopsgate) does not in itself suggest that the station was condemned, for the consolidation of sundries handling was then a commonplace of British Railways' planning. More significant, perhaps, was the fact that the whole future of the important Continental traffic from northern Europe—exchanged both by ferry and by ordinary cargo methods—was being rethought before the fire.

Will there be another Bishopsgate depot?

Possibly—with or without a Channel Tunnel—Bishopsgate would have been scheduled for modernisation as a depot linking London to the golden belt of industrial Europe. Possibly it would have given way to a completely new concentration yard elsewhere. Indeed, for some years there had been tentative plans to build in the area a new freight depot more suited to the motor age. (As it was on two levels, Bishopsgate was expensive to operate—in fact it has been rumoured that handling costs were higher per ton than the total revenue from the traffic, despite a high proportion of transhipment work.) Another idea put forward recently was to use part of the site for a new approach from the GE line to Broad Street, which could then absorb Liverpool Street's peak-hour passenger overflow. But, whichever course was chosen, the transition could have been made over five or ten years. As it is, a decision concerning the future of Bishopsgate has been forced on to British Railways.

As 1965 opened, with months of clearing-up work still in the pending tray, no decision had been announced. Two obvious factors might be expected to influence the Board's decision, however. One was that, less than ten days after the fire, the emergency arrangements were working well. It would be unfair to the memory of an historic building to quote *My Fair Lady* and say simply "We can do b—y well without you". But the fact was that London *could* get along. The other factor, of course, was that 40,000 sq yd of land on the outskirts of the magic City of London had, in itself, a value which might run into seven figures. . . .

In May last year Paris—Brussels was added to the routes over which French Railways run 75 m.p.h. business expresses.
MODERN RAILWAYS reports at first-hand on these new TEEs, the persistent SNCF success in attracting traffic to its first-class only rapides and the speed and service that are steadily increasing custom



Left: A Paris–Brussels TEE at the Gare du Nord headed by new French multi-current 4,540 h.p. electric locomotive No. CC-40103.

Right: The southbound "Mistral" at Avignon on June 13, 1964, headed by electric locomotive No. BB-9275; despite its very fast schedule, this train loads to 700 tons in normal working.

Photos by Epoque Ltd., A. Davenport

The SNCF

G. FREEMAN ALLEN

PARIS–Brussels–Amsterdam was one of the initial Trans-Europe-Express routes. When the first TEE services were inaugurated on June 2, 1957, it was given three services each way daily: the "Ile de France", covered by a two-car French unit with a seating capacity of 81; and the "Etoile du Nord" and "Oiseau Bleu" (the latter circulating between Paris and Brussels only), provided by Dutch-Swiss four-car units with room in each set for 114 passengers.

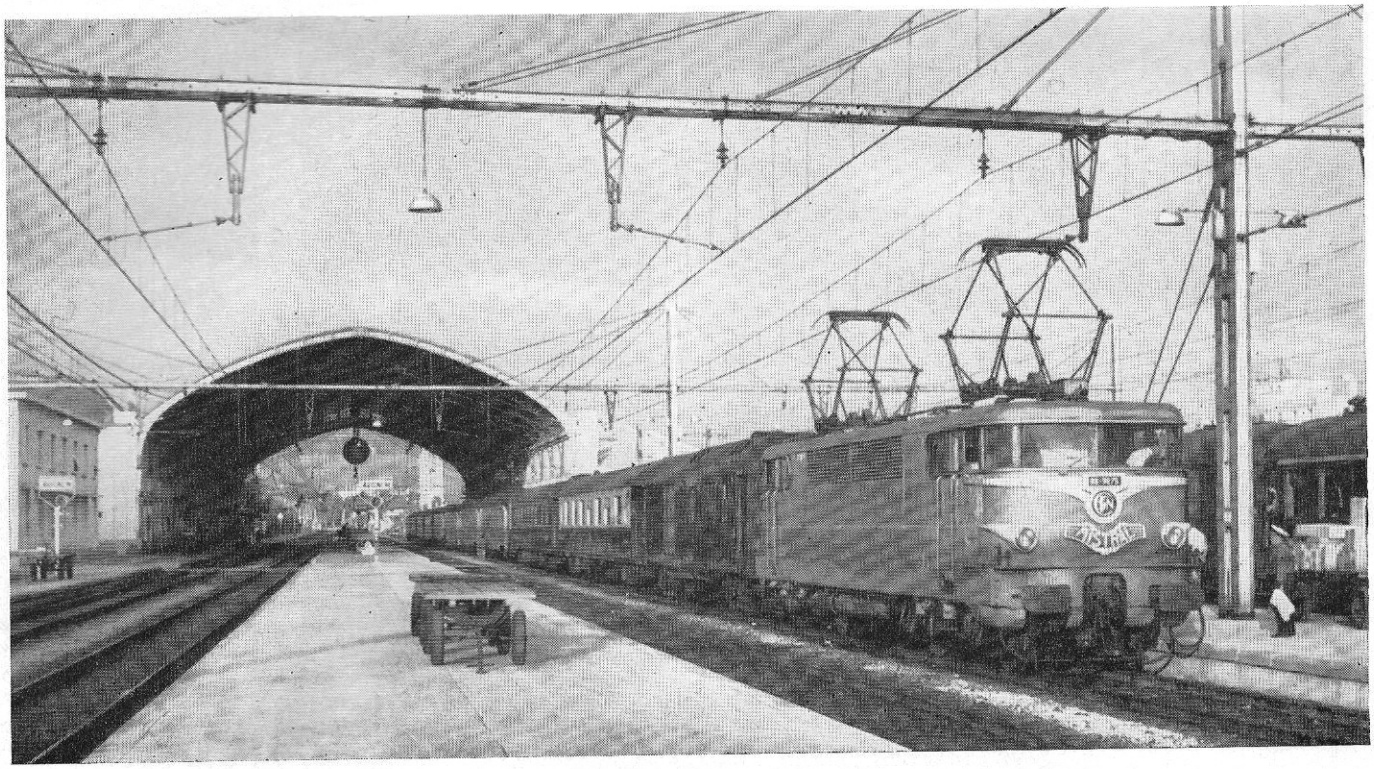
This winter the seating available daily by TEE between Paris and Brussels is treble that of 1957. A fourth daily service, the "Brabant", is operating between the French and Belgian capitals; and all four workings now employ the new locomotive-hauled train-sets described on page 53 of the July 1964 issue, made up to 10 coaches on the services to and from Amsterdam (though only four of the cars travel beyond Brussels) and six coaches on the other two workings. The extra accommodation had to be provided to satisfy the heavy demand which has built up between Paris and Brussels for this first-class only service, which attracts both a business clientele and a substantial commuter business in international civil servants from the various Common Market organisations. Passengers were being turned away in the latter months of multiple-unit working. Even now, I have been told by officers of the SNCF's Northern Region, 10 cars are not always enough to cope with the business on Fridays and on occasion a 12-car formation has been employed.

Although this is an international service, the French element predominates in its operation and promotion. The greater part of the new equipment has been furnished by the French at a cost of about £1½m, locomotives included, and the coaching stock is of essentially French design. Moreover, it is in French territory that the accelerated TEEs make their highest sustained speeds to keep the 2½hr non-stop timing of the fastest services over the 195 miles between Paris and Brussels. A maximum of 93.8 m.p.h. is permissible over three SNCF sections of the route—for some 20 miles north of Creil to Compiègne, for 20 miles before Tergnier and 48 miles before Aulnoye—whereas the fastest allowable in Belgium is 87.5 m.p.h., between Mons and the approaches to Brussels. It is expected that within a year or two further civil engineering improvements on the SNCF's Northern Region main line will see the limit on much of its 93.8 m.p.h. mileage raised to 100 m.p.h.; with that, the Paris–Brussels non-stop time should come down to 2hr 20min. Better than that may be impossible for some years to come; although French Railways are pursuing their 100 m.p.h.-plus experiments in private, the disastrous "Cisalpin" derailment not long ago has made the French Ministry of Transport very reluctant to allow more than 100 m.p.h. in public service.

Passenger-miles increasing

It is fair to regard the improved Paris–Brussels TEE service, therefore, as the latest achievement in French Railways' post-war express passenger service development. In the four years 1960–3 French Railways increased their main-line passenger-mileage figure by 16 per cent and the average passenger journey rose 12 per cent in mileage to 76; results for the first part of 1964 available as I write suggest that the upward trend will have been maintained last year. French Railways emphasise that their policy of acceleration and improvement embraces the whole range of their express passenger services, but it is significant that first-class patronage has risen by 7.7 per cent since 1960, which is indicative of the success of their high-speed, first-class only and supplementary fare inter-city business services.

Trains of this kind are run on most of the principal main lines radiating from Paris. The chief exceptions at present are the Western Region main lines, but of these Paris–Rouen–Havre is certainly a business route and after its forthcoming electrification the SNCF might well turn one or both of its existing first-class only services into high-speed supplementary-fare workings; with the possible exclusion of the line as far as



and the businessman

Nantes, the other routes in this group are the equivalents of BR's East Lincolnshire (in the case of Caen–Cherbourg) or Plymouth–Penzance (Nantes–Quimper) lines and would not justify *de luxe* services.

In speed the first-class only supplementary-fare trains—and amongst them, of course, is the "Mistral"—predominate the multitude of SNCF 60 m.p.h.-plus trains which have already brought almost every important French town and city astride a main line within mile-a-minute train travel of Paris. Cherbourg and Le Havre are the only exceptions of any consequence, but in the case of the latter electrification will soon bring it into conformity. It is this French achievement in speed which has done most to narrow the journey time differential between air and rail over Europe's chief inter-city routes by more than 10 per cent in the past decade.

French Railways regard a terminal-to-terminal average of 100 km.p.h. (62.5 m.p.h.) as the minimum for any train conceived as a businessman's service. To achieve it a high proportion of the trains in this category have to average 70–80 m.p.h. from point to point. The aim is, of course, to bring as many long-distance trips as possible within the compass of a day's out-and-home travel that allows enough hours at destination for business. However, one should add that there is plenty of custom from the commercial world for SNCF sleeping car services, provided that they are fast enough to avoid any sitting up in the evening or early morning; the French businessman wants to go straight to bed and to be able to alight as soon as he has dressed—hence the recent acceleration of the Paris–Marseilles sleepers.

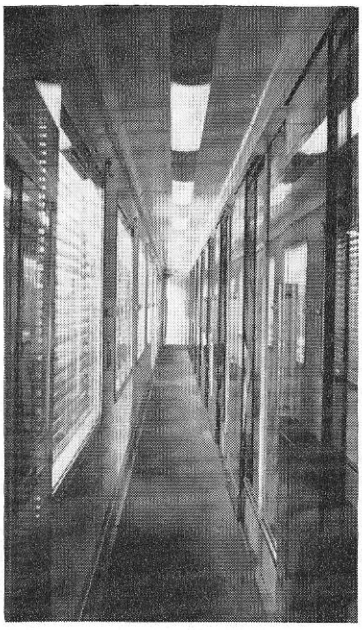
Train grouping facilitates speed

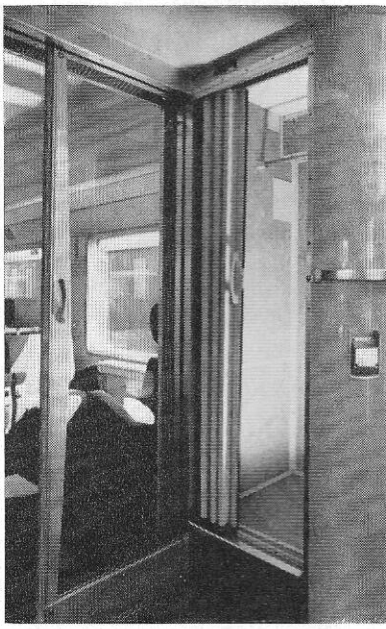
Electrification has facilitated the general upsurge of SNCF express train speed, but it has not been the only impetus. Equally important is the timetable policy accepted as an integral part of the post-war electrification programme—that of grouping trains of similar pace and striving to avoid path conflict between workings of wide-ranging average speeds. This will always give France a rail speed edge over Britain, which expects BR to run a frequent-interval express service throughout the day.

On every main line out of Paris the chief departures are in early morning, mid-day and evening batches. Moreover, the principal morning trains out of the capital are got away by 8.00, or very soon after, to avoid the peak of the morning commuter rush, and few of the chief evening services are sent away until after 18.00. There is a tendency to schedule departures from Paris still later, to suit the longer hours worked by many businessmen nowadays. Significantly, too, many of the fastest schedules are made by the mid-day trains—like the "Mistral" and "Cisalpin"; leaving Paris–Lyons in close succession at 13.10 and 13.15 for their 144min dash over the 196.3 miles to Dijon—which take the tracks at the quietest period of the day. So far as the business world is concerned, of course, these mid-day departures offer the useful chance to do a morning's work at the office before leaving for the provinces.

But is speed the all-important factor in the success of French Railways' business services? Not long ago I went to France seeking evidence. I sampled the Paris–Brussels TEE service, to see if it offered pointers for our own Pullman equivalents, and discussed their approach to the business traffic with SNCF officers at their Paris headquarters.

First impressions of the new French TEE rolling stock reminded one yet again not to pre-judge interiors on the evidence of black-and-white illustration alone. The accompanying photographs do these vehicles scant justice. They make flat and cheerless a simple interior scheme of plain upholstery in strong colours that vary from coach to coach, backed by an off-white embossed wall covering whose only relief is Paul Klee-school motifs on the end walls. In reality, lit by ranks of diffused fluorescent lights arranged laterally in

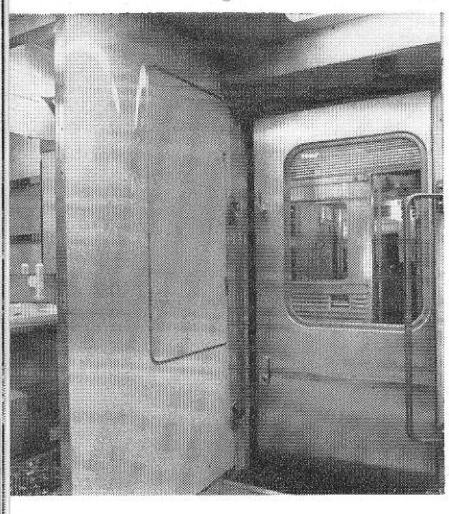




PARIS—BRUSSELS—AMSTERDAM TEE ROLLING STOCK

The upper row of pictures shows the unusual externally-sliding coach doors, which are pneumatically-operated and under the control of the guard; and the skilful use of glass to emphasise spaciousness—note the glass partitions and doors to the compartments in the centre view and the double doors leading to the saloon in the right-hand picture, which also shows one of the vestibule wardrobes.
On the left is one of the open saloons in use for meal service.
The lower row of pictures depicts: a sliding coach entrance door from the inside; a first-class compartment with the venetian blind enclosed in the double glazed window drawn; and a close-up of the semi-reclining seats in an open saloon, with the double doors at the far end opened.

Restaurant car photo by Epoque Ltd.; remainder by French Railways



the ceiling (a much more successful layout than the usual longitudinal tube from one end of the car to the other), the interiors are delightfully warm and rich.

Lunch on a Paris—Brussels TEE

Warmth is, of course, a figurative term; the TEE air-conditioning was blissfully efficient relief from a shade temperature not far short of 80 deg. in Paris. The compartment seating is very comfortable, though in no way superior to the firsts of BR's XP64. I preferred this to the saloon seat I eventually occupied, which was very satisfying but had the defect of the BR "Blue Pullman's" semi-reclining seats—it could not be tilted back far enough for real relaxation, so that one continually felt at one's back a subconscious pressure to sit up straight.

To my mind the outstanding feature of the new TEE stock is its bold use of glass. It convinced me that here railway coach designers have the key to emphasis of the spaciousness and freedom of personal manoeuvre possible in a train by comparison with the cramped environment of an aircraft. All windows are wide and deep and, as in the German "Rheingold" and "Rheinpfeil" stock, the compartments are glass-partitioned on the corridor side. But most striking are the wide, transparent double doors leading from each open saloon to the end vestibules of the car; the breadth of the entrance is such that the nearest, outer seat of each adjacent double table has to be sacrificed to make room for it. As the entrance vestibule beyond, flanked by a luggage store and a coat cupboard, is of the same width as the doors, the spacious effect created is as near that of a first-class hotel dining-room entrance as anything I have seen on rails. The air-operated doors, incidentally, open and close literally at a touch.

The character of the Wagons-Lits service at the tables enhances the impression of a hotel environment. A public address system enables the conductor to welcome diners personally and wish them *bon appétit*; but long before that—and in sharp contrast to the unappetising haste with which the job is so often done a few minutes ahead of the soup on a BR car—we had been offered our *apéritifs*. Again, unless one orders a drink for one's meal simultaneously with the *apéritif* on a BR car, the chances too often are that it will be very difficult to find a waiter to serve it later. On this TEE, there was ample time to enjoy the *apéritif* before the conductor reappeared to take wine orders; and the wine was delivered and uncorked well before meal service began.

Lunch was good and appetisingly served, but not memorable. My bill for *apéritif*, half-a-bottle of modest *rosé*, hors d'oeuvres, entrée, cheese, ice cream and coffee, with service, came to 33s. This was expensive by BR standards, of course (and so was Continental breakfast and a banana in the Wagons-Lits car of the outward "Night Ferry" the previous morning, compared with the superb full English breakfast for roughly the same money in the BR car of the inward "Night Ferry" next day); but then I had the previous afternoon paid as much as 15s for an omelette, beer, ice and coffee at a Paris boulevard café.

Air-conditioning—but no secretaries

Although French Railways have now long-welded some 6,000 miles of track, a high proportion of the Paris–Brussels route is still of ordinary jointed rails. On this the new TEE stock rode well, though there was the muffled heavy judder over the joints of certain sections that one senses in a BR Commonwealth-bogied coach. On long-welded track the riding was faultless, but overall I would not rate these coaches quite as highly in this respect as the German "Rheingold" and "Rheinpfeil" stock. As always, however, highly efficient soundproofing concealed any minor riding faults unless one was intent on a critical assessment.

Later I asked French Railways officers whether they thought full air-conditioning was now an essential on the modern passenger train. Their answer was negative. They agreed that it was becoming more and more a feature of everyday life—in homes, shops, restaurants, cinemas and so on—but thought that the time had not yet come when its application to trains could be relied upon to attract more passengers. On the new "TEEs" it was admittedly a gimmick, though on the "Mistral" it was more of a necessity, because of the changing climates through which the train travelled on its long run from Paris to Marseilles, particularly the contrast between the humid heat often encountered on the Dijon–Lyons stretch and the dry heat of the coastal area itself.

The new Paris–Brussels–Amsterdam TEEs carry neither train secretaries nor telephones. Like BR—but unlike the German Federal—French Railways feel there is no significant demand for these business aids. They hold that the businessman travels by train to relax; besides a fast and reliable service, his other requirements are chiefly comfort and a good restaurant and buffet. If he wants to work, it will usually be to prepare himself for the job at destination, not to carry on his usual office chores.

Nevertheless, French Railways are incorporating a secretarial service in the new "Mistral" train scheduled to make its debut this summer. Train telephone facilities are confined at present to the Paris–Lille express service, but they are not intensively used; I was told that an average of about 40 calls a day are made from these expresses. Nevertheless, both in France and in Western Germany the businessman is beginning to expect them as a standard service on business trains; a German Federal move to eliminate some recently was met by such a wave of protest that the idea had to be dropped.

Arrival in Brussels on my TEE trip was immaculately punctual. It set the seal on another experience to strengthen conviction that, given high speed, reliability and up-to-date equipment, the long-distance express train is still a powerful competitor in the travel market. But not, perhaps, for pleasure traffic when a supplementary fare is charged. This was a Saturday trip and the passenger complement of the "Brabant" was woefully thin. Lightly occupied, too, was the "Ile de France" when I watched it leave Brussels that evening; and a Saturday or two later a colleague visiting the Netherlands reported a similarly light traffic on these TEEs. This is the reverse of the coin to counterbalance the public relations advantages of operating a standard seven-days-a-week timetable.

Why French are rail-minded

SNCF officers in Paris confirmed that pleasure travel is a small proportion of the trade on these first-class only trains, which are 70 per cent patronised by people on business. Some of the services are taking on the atmosphere of a travelling club. Increasingly businessmen plan their trips in small groups, not merely from their own firm, but amongst colleagues in associate or neighbouring concerns. Long, multi-course meals encourage this kind of travel, which is impracticable by any other medium. On the "Mistral", I was told, lunch lasts 1½hr or more. Then, after coffee and liqueurs, a good many passengers move on to the buffet for a long session at the bar. By the time they have finished, the journey is better than half over.

Almost all this business traffic is over routes radiating from Paris, the principal streams being between the capital and four big industrial areas—Lille, the North-East of the country, Lyons and Marseilles. There is a substantial traffic between the Lyons and Marseilles areas, but otherwise no particularly significant movement between provincial cities. All three of the chief business routes out of Paris are electrified and the resultant point-to-point speeds make their express services successfully competitive for runs up to as much as 400 miles. Between Paris and Strasbourg or Lyons, therefore, and even as far as Valence on the ex-PLM main line, French Railways are confident that the Parisian will opt for their services rather than those of Air Inter, the domestic airline.

Air services are undoubtedly the principal rival for French inter-city business traffic on most routes, except perhaps Paris–Lille and Paris–Rouen. Motoring is less attractive than in Britain. First, inter-city distances are greater; even Lille and Le Havre, regarded by the average Frenchman as "near Paris", are 160 and 140 miles away, but Lyons, Strasbourg and Bordeaux, for example, are further from the capital than Tyneside and Tees-side are from London. Second, over much of France winter conditions can be extreme and then Frenchmen, to whom fast driving is second nature, are for safety's sake reluctant to motor long distances; train heating, too, is much more efficient. In summer the roads are out of favour

because so many of them are thick with tourist traffic, which breeds its own dangers.

In competition for business traffic with the air French Railways have two other important advantages over BR. First, the customers in general live much closer to the main railway stations. Second, air and rail are not in cut-throat rivalry with each other.

They live in city centres

The average French businessman is more likely to reside in the central area of his city than on the periphery. Paris, for instance, has few of the upper middle-class suburbs that ring outer London from Sevenoaks through Guildford to the Chilterns, while in Lyons, to cite a provincial example, the homes of the silk manufacturers line the Rhone close to the heart of the metropolis. A high proportion of the potential clientele therefore lives within 15–30min taxi-ride of a main railway station and, conversely, an often inconvenient distance from the nearest city airport. So often in Britain this state of affairs is reversed.

Not only is there no demand for outer suburban railhead stops by SNCF early morning and late evening business trains. Since few passengers have far to travel between home and railhead, these trains can leave early and arrive very late, up to midnight or even a little beyond. Coupled with high point-to-point speeds, that means that out-and-home journeys in a day with comfortable time for affairs at destination are possible over far longer distances than in Britain. By catching the 7.45 from Paris–Lyons one could be in Valence, 383 miles away, in time for lunch at 13.19, then have the whole afternoon for business before returning at 18.13 on the "Mistral", to regain Paris by 23.25. Provincials think nothing of beginning their trips to Paris as early as a 7.00 departure; Parisians usually prefer to set out a little later, although they are quite prepared to make a 7.23 start from Paris–Nord on the "Parsifal" TEE in order to reach the Ruhr, 330-odd miles away, soon after 13.00; the return "Parsifal", leaving Essen at 17.7 or Düsseldorf at 17.38, will have them back in Paris by 23.51.

Success of self-drive car hire

The preference of French businessmen for in-town homes explains why there is in France none of the clamour for city station car parks that is loud in this country. If the businessman needs a car at destination, self-drive hire facilities are now available at 140 SNCF stations. Cars can be booked in advance by telephone or telegram through any major station on the system and at a high percentage of the hiring points the user can hand his car back on the station premises at the last moment before he catches his train home. This service is now available to Frenchmen travelling internationally at 30 German, 21 Italian, 15 Spanish, 12 Belgian and 10 Swiss stations. With the demand for self-drive car hire steadily rising—in 1951 cars were rented for 26,000 days; in 1963 the total was over 100,000—French Railways have stimulated more orders from its principal customers, the business world, by offering a season ticket at cheaper rates and with fewer contractual formalities to travellers hiring vehicles for more than 15 days a year.

The qualifying amount of hire for this season ticket looks surprisingly small by the standard one would expect of BR in a similar context. This is indicative of differing BR and SNCF commercial approaches to business passenger traffic. BR holds, generally speaking, that the British businessman will contentedly pay full fare if he can be won over to rail travel on other considerations; any cheap fare scheme aimed at the general public which leaves a loophole to the financial benefit of the business traveller tends to be frowned upon. The French believe that businessmen should be given as much financial inducement as anyone else to make maximum use of the railway; hence, their *abonnement* schemes offer special concessions to the business world.

The *abonnement*, a species of season ticket, is available to all frequent travellers, and for anyone piling up high annual mileage the half-price card is a bargain. Purchase of this allows one to buy tickets for a specified journey or in specific zones of the system at half-price for periods ranging from a month to a year. As an example, a half-fare first-class card for a 250-mile itinerary costs initially £8 17s for a period of three months' travel, £14 7s for six months' travel, or £22 1s for a year's travel. There is also a deposit of 8s per card, which is refunded provided that the card is returned to the issuing office not more than eight days after its validity expires.

Armed with this card, the holder can purchase all his travel tickets over the specified route for half-price during the currency of the card. In the 250-mile instance quoted, he will have covered the initial price of the card and start to show a saving on full-fare tickets after his third return journey on the three-month card, his fourth return journey on the six-month card, or his sixth return journey on the year card. Anyone making a monthly return journey throughout the year between, say, Paris and Strasbourg can therefore make six of his trips at half-price. The further the journey the bigger the saving, so that a year's half-price card between Paris and the Riviera would pay off after only three return journeys. The six-month card can be paid for in two instalments, incidentally, and the year's card in three.

Big discounts for business world

On top of the general discount afforded by these half-price cards, a reduction in the first cost of the cards themselves is offered to the business world. They can be bought for several personnel of one firm at 20–40 per cent off the normal price (but only for use on the firm's business), while bona fide commercial travellers get a 50 per cent reduction. Small wonder that the SNCF sees no need of a BR-type warrant scheme.

An even more striking difference between French and British conditions is that the SNCF and Air-Inter make their respective *cartes d'abonnement* inter-available for mixed air-rail out-and-home journeys. There are some limitations to this arrangement, the most important being that it applies only to SNCF first-class ticket holders and that the journey must be between the same two points in each direction, while certain popular Air-Inter routes are excluded from the scheme. Where it is applicable, the Air-Inter card-holder is allowed a 20 per cent reduction on his SNCF ticket (as opposed to the 30 per cent he gets off his air fares during the card's currency), while the SNCF cardholder is granted a 20 per cent discount on the air fare.

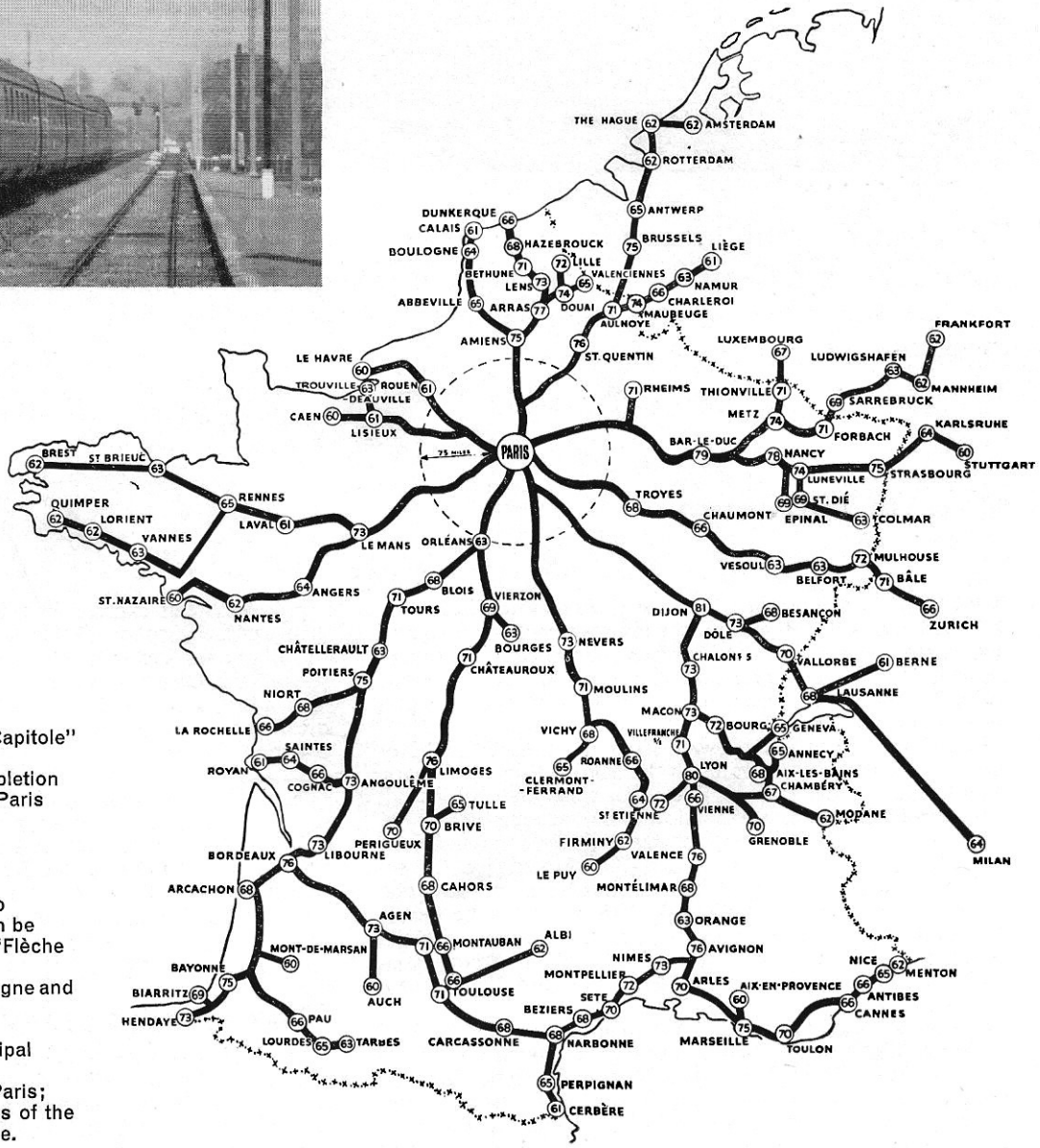
This is one outcome of the 25 per cent SNCF interest in Air-Inter. Others are that the two concerns co-ordinate their timetables and regulate their fares to avoid wasteful competition. The Air-Inter fares range from 25 to 50 per cent above the level of the full first-class rail fare.

Is French Railways publicity for business trains specially extravagant or extensive? Apparently not, it seems. On the evidence of one's own eyes in France, the propaganda specifically directed at this market does not seem nearly so lavish as BR thrusts on the British commercial world. I gathered that French Railways do no personal canvassing. Twice a year, however, a brochure outlining the principal SNCF express services is despatched to some 700,000 addressees. The recipients are not only men in commerce, but men in the professions—doctors, lawyers, professors, architects and so on. These brochures are all mailed from the Commercial Department in Paris, but the addressees are suggested by the *Chefs d'Agence* in the Regions.

French proud of SNCF

There is, of course, one final, critical difference between the environments in which BR and the SNCF compete for business travel. In France, train travellers in any section of the community are not "squares". The French as a nation are fiercely proud of their railways and the SNCF's post-war achievements. That pride is worth a fortune in propaganda expenditure. So long as the SNCF continues to satisfy it with a fast, reliable and continuously developing service—and there is no doubt that the number of supplementary-fare high-speed trains will grow as more electrification is completed—the odds are at least even that air travel will not make any substantial inroads in the SNCF share of the business passenger travel market.

THE SPEED OF FRENCH INTER-CITY SERVICES



Top left: The Toulouse-bound "Capitole" at Limoges, headed by electric locomotive No. BB-9283, after completion of its 75 m.p.h. non-stop run from Paris on April 9, 1963.
Top right: A Belgian Railways multi-current electric locomotive leaves the Gard du Nord, Paris with the midday "Brabant" TEE to Brussels; on the extreme right can be seen the leading Pullman of the "Flèche d'Or" ("Golden Arrow").
Centre: A German TEE from Cologne and the Ruhr heads for Paris through Chantilly.
Right: A map showing the principal towns and cities served by 60 m.p.h.-plus rail services from Paris; the average speed including stops of the best service is shown in each case.

Photos by M. Aubert, French Railways, K. L. Cook

Stoke

Pre-electrification inconveniences are a handicap, but the public is being infected with Stoke railwaymen's excitement at the service they will offer in 1966. Meanwhile, modern techniques and a vigorous sales effort are promising important freight gains

Marcus Newman

PART 1

TRYING to sell a product one knows can be vastly improved is an unenviable job, even if the improvement is a certainty firmly dated for achievement. This was underlined by exchanges between a Stoke-on-Trent manufacturer and Mr. George Dow, Stoke Divisional Manager of the LMR, in two national newspapers last December.

Stoke took a heavy side-swipe from the transfer of Manchester–London through trains to the Midland line during the electrification of the Western line. As a result the city lost all but one of its direct trains to and from Euston, which originated or terminated at Manchester, and was reduced to connections at Stafford or Crewe for most of its London service. Consequently, as the Stoke complainant pointed out, whereas one could get from Euston to Stoke in 2hr 25min by the fastest train of 1938, the quickest journey on offer today—with the almost inescapable change at Stafford—is 3hr 8min. Even Stafford cannot be reached in less than 2hr 32min from London.

Comparisons of this kind are a drearily familiar form of sniping at BR and too often ignore that, although differences between the best of 1965 and 1938 may in some cases be marginal, today's quickest times are virtually standard and not a flash of brilliance by one or two trains. Criticism of Stoke's raw deal, however, is incapable of rebuttal by any such qualification. Freight service may be splendid—and certainly more important in terms of the much greater revenue it produces—but express passenger services are the railway's shop-window display; if they are deficient the marketing of all railway services is handicapped to some degree. In Stoke, all that the Divisional Management can presently hope is to turn away wrath with graceful apology for inconvenience, stressing that the city is paying a temporary price for a radiant transport future.

Stoke's own sun-up is timed for 1967, when its main line will be fully integrated in the LMR's a.c. electric network. A year earlier, after completion of electrification to Euston, however, it will at least catch dawn's early light. From January, 1966 the western area of the Stoke Division will have the full benefit of the first post-electrification timetable between Euston, Manchester and Liverpool that will precede introduction of the full working when the West Midlands and North Staffordshire electrifications are ready.

Stoke–London every two hours

The basic structure of the full post-1967 timetable has been revealed locally and justifies the Stoke Divisional management's claim that the future is worth a patient endurance of a very inconvenient present. Stoke itself will have an express to and from Euston every two hours throughout the day. These will be London–Manchester expresses, allowed 1hr 55min between Stoke and Euston and 2hr 40min for the full journey. They

will alternate over the southern part of the Western main line with expresses every two hours between Euston and Liverpool, allowed 2hr between London and a Crewe stop and 2hr 40min overall. There will also be trains every two hours in each direction between London and a cycle of other destinations in the North-West–Blackpool and North Wales, for example—which will serve Stafford, bringing it within 1hr 50min of London. Birmingham will have hourly trains to and from Euston in 1hr 35min and these will be projected beyond Birmingham to Manchester and Liverpool alternately, in each case taking 1hr 45min for the remainder of their journey; as a result Birmingham will have an hourly service to and from Crewe, timed in 60min over this section. All these schedules are at present provisional. It was emphasised to me, however, that any changes will be towards faster working, rather than a relaxation of present estimates.

Stoke's other principal electric service will be one of semi-fast multiple-units between Manchester and Birmingham. These will run every two hours each way and call only at Stockport, Macclesfield, Congleton, Stoke, Stafford and Wolverhampton. Their Stoke–Manchester journey time will be 50min and they will bring Birmingham within 60min travel of Stoke. On the local side, there will be a two-hourly all-stations service between Stafford and Manchester via Stoke and another from Stafford southward up the Trent Valley main line to Rugby, calling intermediately at Rugeley, Lichfield, Tamworth, Polesworth, Atherstone and Nuneaton; of the latter six towns, only Nuneaton will get regular service by the express trains after electrification, but one up morning and one down evening train will serve Lichfield Trent Valley and Tamworth. The stopping service between Crewe and Derby via Stoke will still be maintained throughout by diesel multiple-units.

Obviously, the achievement of electrification and the fast, patterned passenger service that will ensue is dominant in any discussion one has with officers at Stoke, because so much of their territory will benefit from it. The backbone of their Division, which was fashioned in the LMR Divisional reorganisation of July, 1963 out of the northern half of the former West Midlands Division, with an appendix from Stafford to Shilton, is the West Coast main line itself from Nuneaton to Crewe inclusive. The ex-North Staffordshire main line under electrification is also in the Division's hands from Colwich and Norton Bridge to a point beyond Congleton. Thus, of the eight trunk routes which converge within the Division, making Crewe their focal point, only three—Crewe–Shrewsbury, Crewe–Chester and Crewe–Stoke–Uttoxeter–Derby—will remain un-electrified after 1967.

The long-term passenger plan

Apart from the lateral routes bisecting the Lichfield–Nuneaton appendix of Stoke's territory, the trunk routes mentioned above are the only lines in the Division which will carry passenger traffic in the long-term plan. Ultimately they may be serving fewer than 30 stations in the Division. Most of the remaining lines seem likely to survive for freight use only, but one is dubious about the long-term future of the Wellington–Crewe line, already reduced to freight-only status. In essence it is an alternative route for West Midlands–Crewe traffic, for the whole of which the main line from Bushbury Junction, Wolverhampton, to Crewe via Stafford ought after electrification to have adequate capacity—and, in fact, a need, in order to extract a high utilisation from its electric locomotives.

Since the formation of the Stoke Division, the Nantwich Junction–Wellington, Leek–Uttoxeter, Creswell–Cheadle, Stoke–Silverdale and Stoke Loop passenger services have been withdrawn. All five are claimed at Stoke headquarters to have been economically hopeless cases, killed as much by bus competition as by private motoring in the last two instances.

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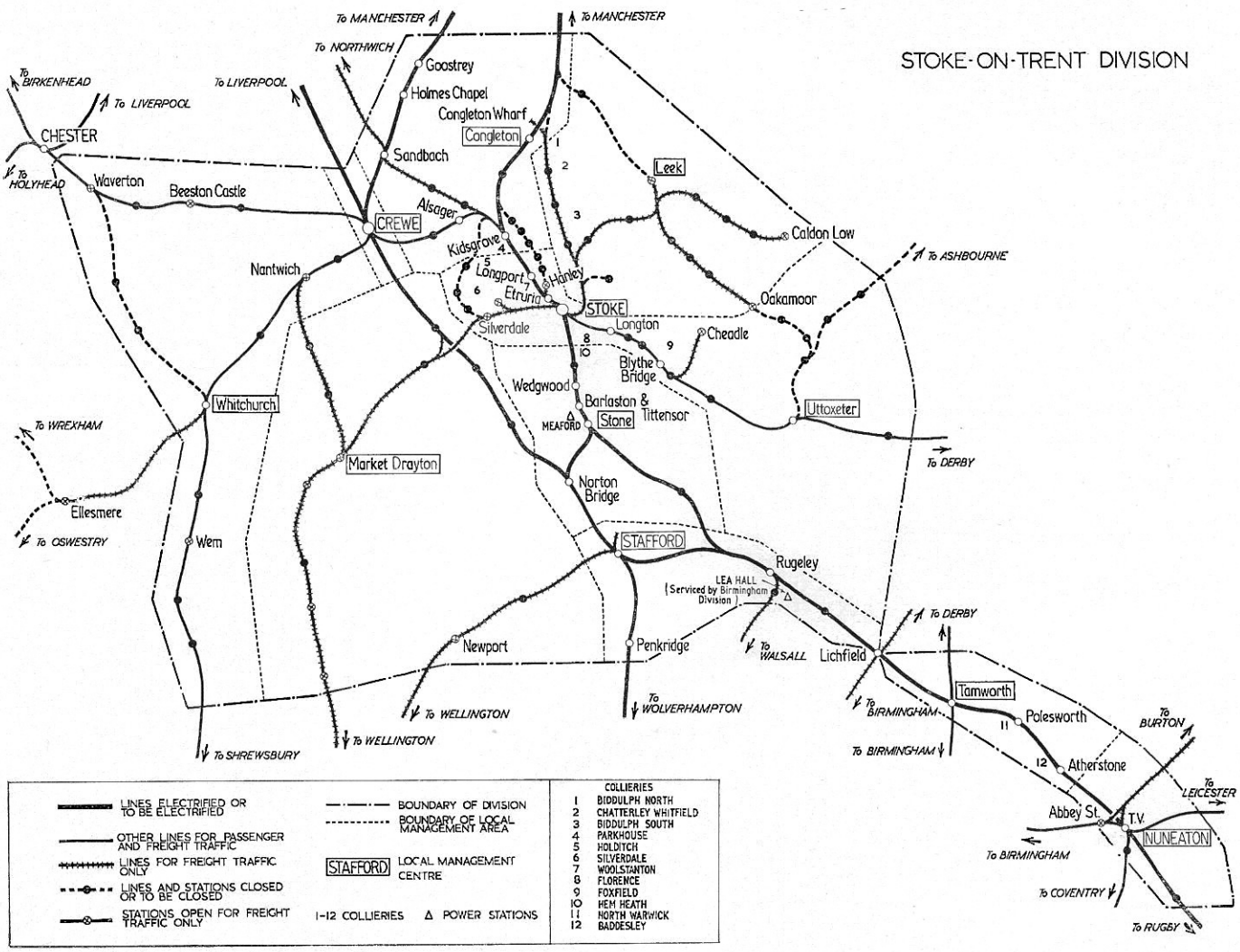
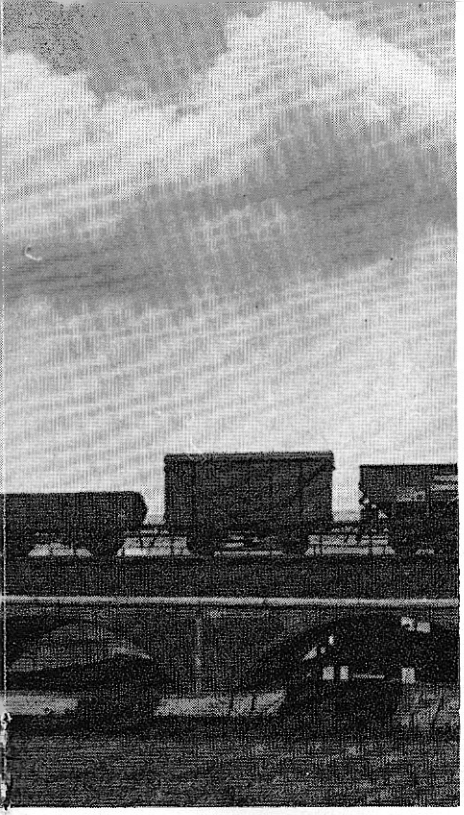
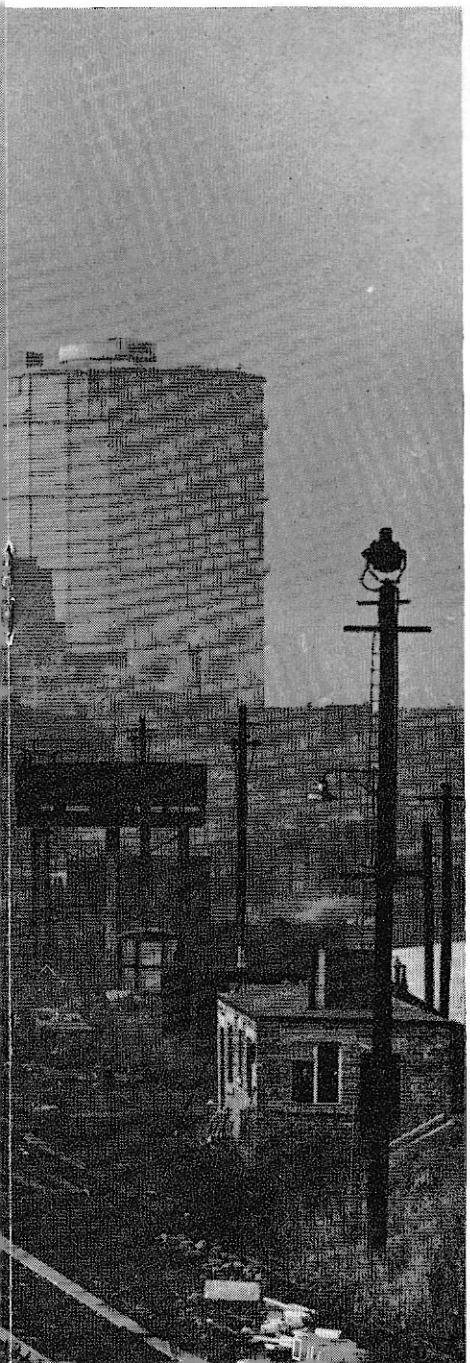
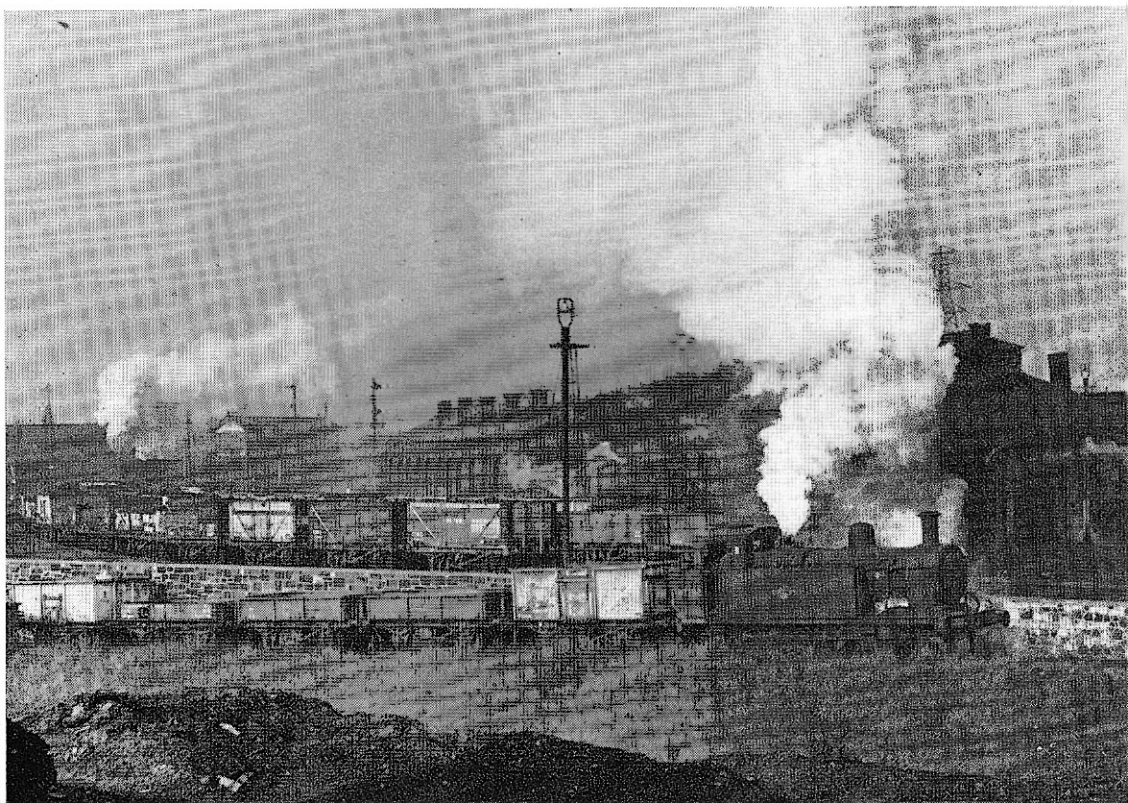


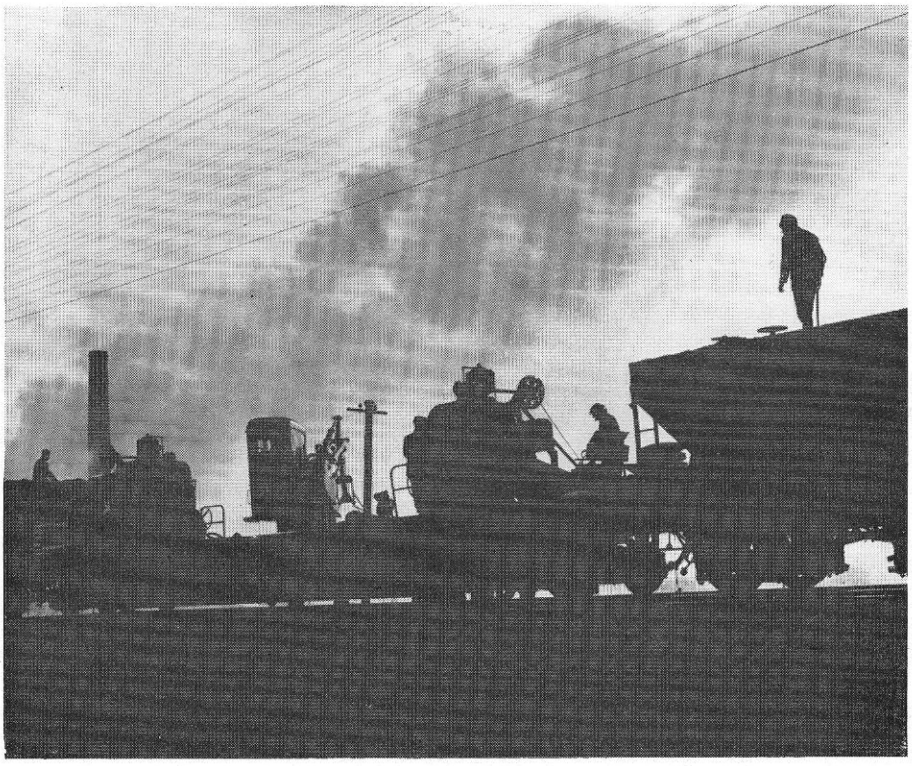




Stoke freight working is still largely steam

Above left: A Class 4F 0-6-0 approaches Engine Shed Junction, Stoke with an up freight.
Above right: Class 5 4-6-0 No. 45131 comes off the Crewe line at Kidsgrove Central Junction.
Below left: Newcastle Junction, north of Stoke, with the Newcastle line diverging to the left. Class 5 4-6-0 No. 45060 heads a brake van up the main line and the freight on the left is powered by a Class 4 2-6-0.
Below right: Trip working in the neighbourhood of Stoke m.p.d. is undertaken by Class 3F 0-6-0 No. 47280.
Photos by C. T. Gifford





Left: Work trains are busy on the former North Staffordshire main line preparing it for electrification; specialist equipment for cementing the foundations of the overhead wire supports in action near Barlaston, south of Stoke.
Photo by C. T. Gifford

Right: The biggest civil engineering operation at present in progress in the Stoke Division is the construction of the Harecastle Tunnel deviation. An up diesel multiple-unit was photographed near the entrance to Harecastle North Tunnel where the deviation takes off.
Photo by C. T. Gifford

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Demand for local rail services has in any event never been high, because the area has no really sizeable conurbations. Submissions for abandonment of the Crewe–Chester and Crewe–Shrewsbury local trains are now grinding through statutory machinery.

For the rest, a proposal is expected for rationalisation of the Crewe–Derby diesel multiple-unit working, which is presently a hybrid cross-country semi-fast and Potteries local service; the intention is to re-shape it more clearly as the former. This would entail closure of some probably unremunerative intermediate stations, most of them between Stoke and Derby, with a resultant cut of the Crewe–Derby running time by perhaps 20min. Quicker turnrounds should enable the service to be operated with three three-car units, compared with the present four, which also need strengthening at the peak period. It is held at Stoke that the outcome would be a more attractive service to the larger proportion of potential users.

A recent canvass of local authorities has shown that the population in the Stoke Division will probably have increased by close on 100,000 when the electric services are fully operative. Most of this growth will be concentrated on Atherstone, Crewe, Kidsgrove, Lichfield, Newcastle, Newport, Rugeley (to be the site of yet another new power station), Stafford, Tamworth and Uttoxeter. Of these towns, Crewe and Stafford will have the immensely improved rail service on their doorstep. From a passenger traffic viewpoint, both are thriving centres now, since they have not suffered anything like the electrification inconveniences of Stoke itself. Crewe, in particular, produces an originating revenue that is quite disproportionate to the size of the town itself; it has been adopted as a railhead by motorists from points as far afield as Stoke, Congleton, Sandbach, Northwich, Knutsford, Whitchurch and even Chester.

Are local service plans too timid?

The other growth towns will get limited or even fringe benefits from the 1967 electric timetable. In the case of those actually astride the electrified railway, one wonders whether present plans may not require revision after initial experience. Rugeley, Tamworth and Lichfield are well-equipped railheads with ample car parks and the onset of electric working could stimulate their development substantially. That none of them are to be frequently served throughout the day by expresses is of less consequence than the adequacy of their service by local trains between Stafford and Nuneaton, since the travel trend from these towns is chiefly a lateral one to other parts of the Midlands, such as Nottingham and Leicester. Will the local trains be frequent enough to attract a reasonable share of the travel potential? The track capacity will surely be there to run a more intensive service quite cheaply in the reasonable hope of building up business.

In a good many areas of the Division new custom for the electrified service will depend upon adequate car-park provision at convenient railheads and better bus/rail connections. The Divisional Manager is intently interested in both requirements, but of the two, bus/rail interchange is the more difficult problem to resolve for all the usual reasons—chiefly, of course, the natural disinclination of bus operators to divert a service to a station and prejudice to any degree its usefulness or economy on its existing route. The most promising situation exists at Stafford, where negotiations have been active for some time on the possible creation of a bus terminal within the precincts of the newly modernised station. Enlargement of car parks is being pursued, particularly with an eye to the adaptation of redundant goods yards, but at two principal centres where the existing parks are either inadequate or badly sited—Crewe and Stoke—it will not be easy to find fresh room. Automatic control of all large car parks is proposed.

Although some of the detailed environment of the new electric service has not been finally shaped, the prospectus of the train service itself that has been circulated by the Divisional management has already aroused interest on a scale to cheer the spirits of the local railwaymen. "When I talk to a public body," Mr. R. W. Hall, the Commercial Manager, told me, "I find that a great deal of my own enthusiasm about the future is reciprocated."

What is more, the public will be offered powerful inducements to make the most of their electric trains. The management at Stoke has been impressed by the success of the Canadian National "Red, White and Blue" fare plan, with its replacement of a multitude of tickets by a simple range of three colour-coded according to rate and availability, to which MODERN RAILWAYS has drawn frequent attention. It would like to see a similar policy applied to the electrified LMR services, but with two fare levels instead of three. The standard fare—plus, of course, any supplements there may be for superior accommodation, such as Pullmans—would be applied only to the best-patronised trains: in other words, to those services, generally the morning and evening peak trains throughout the year and all trains on the busy holiday period Saturdays, on which a high load factor can be obtained at the full fare and which it would be pointless to overcrowd by concessions. For all other

daytime services a distinctively-coloured range of tickets, at perhaps 25 per cent below full fare, might be issued. A scheme of this kind, of course, would exploit the scope which cheaper off-peak current supplies allow to an electric railway to bid for new off-peak traffic with competitive fares, as MODERN RAILWAYS' electrification supplement of last November pointed out.

Electric locomotives not depot-based

The performance now obtained from the electric traction points to a highly successful inauguration of full electric working. True, failures in traffic are still occasionally experienced, but only 1 per cent of them nowadays are attributable to technical defect. The remainder are traceable to the as yet inadequate experience of some drivers. But many of these are put right on the spot. Telephones are spotted at half-mile intervals along the electrified lines and these communicate direct with the electric traction controller's desk at Crewe, so that a driver in difficulty can be quickly put through to the inspector in charge of crew training. Often the trouble proves to be of the relatively trivial kind which the driver, given more time on the locomotives, will be quite competent to deal with himself. Such defects are soon diagnosed by the inspector, who has trained the man and knows just how to spell out the remedy quickly and clearly over the phone. As many as 60 per cent of today's incidents in traffic are settled that way. In the event of more serious trouble with a traction unit, road vehicles are on hand at the depot to rush an engineer to the scene of the failure.

In day-to-day working none of the electric locomotives are depot-based. The diagrams, which now cover practically the whole fleet, provide for each unit to be in traffic over seven days continuously, after which it is sent to a maintenance depot for examination; but if the latter is the basic seven-day inspection only, involving such essentials as brake blocks and pantograph collector strips (coupled with cleaning), and not one of the longer routines at multiples of 180 days, the unit should be ready for work again within the hour. For their longer-term examinations the locomotives are despatched to specific maintenance depots, each of which is allocated the care of a certain type to economise in the provision of spares. Crewe, the only electric maintenance depot in the Stoke Division, has charge of the AEI-built locomotives.

That electric traction demands a fundamentally different approach to motive power diagramming is commonly accepted by all branches of the railway. No doubt the totality of change from one form of motive power to another that characterises the start of most electrified services makes it easier for electric traction experts to persuade their operating colleagues to alter established practice just as radically. Diesels, by contrast, are generally introduced piecemeal. On BR, at any rate, they have always begun work side by side with steam. This had several undesirable consequences, one of which is that too many operating habits of steam days have been unthinkingly carried over into the diesel age, when they can become

wasteful anachronisms. One still comes across instances where, for example, a diesel locomotive is sent on to depot between trips, although it may not need attention—not even refuelling. Often it is merely serving as an expensive taxi to get one crew to the depot for signing off and to pick up another, which could be avoided if the men signed on and off at a convenient station or yard.

The Maintenance Officer of the Stoke Division, Mr. J. K. Lord, is anxious to see his diesel traction employed as nearly as possible on the same principles as the electrics. One essential is the integration of traffic and traction control, along the lines described in last month's article on the ER's Tinsley depot. A maintenance engineer is being stationed in the Line Manager's traffic control at Crewe, to encourage maximum utilisation of diesel and electric power as well as to safeguard strict adherence to units' maintenance schedules. During the night shift, this maintenance representative in Control can also direct technical activity in the maintenance depots.

The main-line diesel locomotives allocated to the Stoke Division are exclusively English Electric Type 4s and BR/Sulzer Type 2s, but diesel-hydraulics of the WR also work into Crewe. The locomotives are concentrated on Crewe diesel maintenance depot, which is well equipped for the job, but, since it was designed initially for steam power, not ideally laid out for work on diesels. Stoke Cockshute is a Modernisation Plan diesel multiple-unit depot, which also caters for five diesel shunters; this undertakes the maintenance of multiple-units operating to Crewe, Birmingham and Derby, which stable overnight at Crewe and Monument Lane, as well as those on Potteries workings. Finally there is a diesel light maintenance depot at Nuneaton, which has just ended a period of unusually heavy activity with the transfer of the diesel-to-electric traction changeover point from Nuneaton to Rugby; a proportion of the Type 4 diesels on West Coast main line work were examined during their turnrounds at Nuneaton.

The amount of steam traction languishing in the Stoke Division is not an accurate measure of present steam working, as the Division has been nominated a reception area for redundant locomotives awaiting withdrawal, sale or scrapping. Only some 10 per cent of the Division's traffic is still diagrammed for steam and many of its enginemen now go for months at a time without touching a steam locomotive. All steam working on electric lines should be at an end with the completion of electrification at the close of 1966. Of steam motive power depots, only Stoke and Crewe South will survive in the Division.

A power signalbox for Stoke

Resignalling has accompanied electrification throughout the LMR a.c. network and the Stoke Division has a major scheme still to come, at Stoke itself. A vacillating policy on signalling control methods, changed first through fright at the high costs of physical equipment and then revised after a fresh look both at mounting annual costs of human operators and the increasing difficulty of recruiting them, will make the Stoke box an isolated all-electric power installation. As a result, a route diagram showing the ultimate signalling systems to be used on the main lines north of Rugby looks piebald. After the area of the Nuneaton power box comes a lengthy stretch of electro-mechanical operation, then a short section of power-operated signalling under the control of Norton Bridge; on the North Staffordshire line this will abut on the control area of the new Stoke box, but from Grange Junction, Etruria to the outskirts of Manchester the ex-NS line will be electro-mechanically signalled. Back on the West Coast main line, there is an electro-mechanical gap between Norton Bridge and the limited control areas of the pre-electrification Crewe North and South boxes. From Crewe the Styal route to Manchester is controlled entirely by the power boxes at Sandbach, Wilmslow and Manchester Piccadilly, but electro-mechanical operation dominates the Crewe–Liverpool route, except for the areas of the Weaver Junction and Edge Hill power signalboxes.

The retention of so much electro-mechanical signalling and in particular of the old-pattern boxes at Crewe and Stafford will be an operational handicap. Obviously, the restricted view of signalmen in the small signalboxes north of Nuneaton, and the inability to co-ordinate their traffic control work to the same pace as those of men at each end of a large route-setting panel, will nullify some of the improved regulation of through traffic to be secured by the new power boxes at Nuneaton and Rugby. At Stafford, the perpetuation of the two main signalboxes, with their slotted signal arrangements, is a specially serious drawback to the smooth processing of through traffic at the speeds envisaged after electrification, though the signalmen readily accept the challenge and realise they must be on their toes to get expresses a clear road through the station when traffic is heavy.

Crewe and Stoke controls combined

There will be other inconsistencies. For example, the installation of automatic train reporting apparatus in the new power boxes is now under consideration. These devices would be linked directly to displays in the Traffic Control office, but from the crucial traffic centres of Crewe and Stafford the information will still have to come, inevitably with much less promptness, from booking lads in the electro-mechanical boxes there.

At present the Division has two Traffic Control offices, at Crewe and Stoke, but their work is to be combined in one room at Stoke. This will be set up with entirely new equipment of the most modern character and all telephone circuits will be reorganised. The new Control office is scheduled to be in operation by next December. It will supervise the West Coast main line as far south as Shilton; at present the scope of the District Control at Rugby extends to Milford and Brocton.

The biggest single engineering work going at present in the Division is, of course, the Harecastle Tunnel bypass, which was fully described in the December, 1964 issue. On the already electrified West Coast main line station modification is complete, with the rebuilt Stafford and Tamworth stations outstanding symbols of the new BR image. In the colder financial climate that has set in since they were put in hand, nothing so ambitious has been undertaken on the North Staffordshire route. The buildings at Stoke are, however, being extensively renovated and the facade is to undergo a thorough cleaning. Because few services will terminate at Stoke after electrification, the layout has been reduced by removal of the down centre road between the up and down main platforms; the space freed will be occupied by the overhead wire structures. Some of the smaller stations were fairly substantially altered and had their platforms lengthened to take eight-car trains before the purse-strings were tightened, but others which have become due for overhaul more recently have been treated to the minimum of alterations and will still accommodate only one four-car multiple-unit comfortably at their platforms.

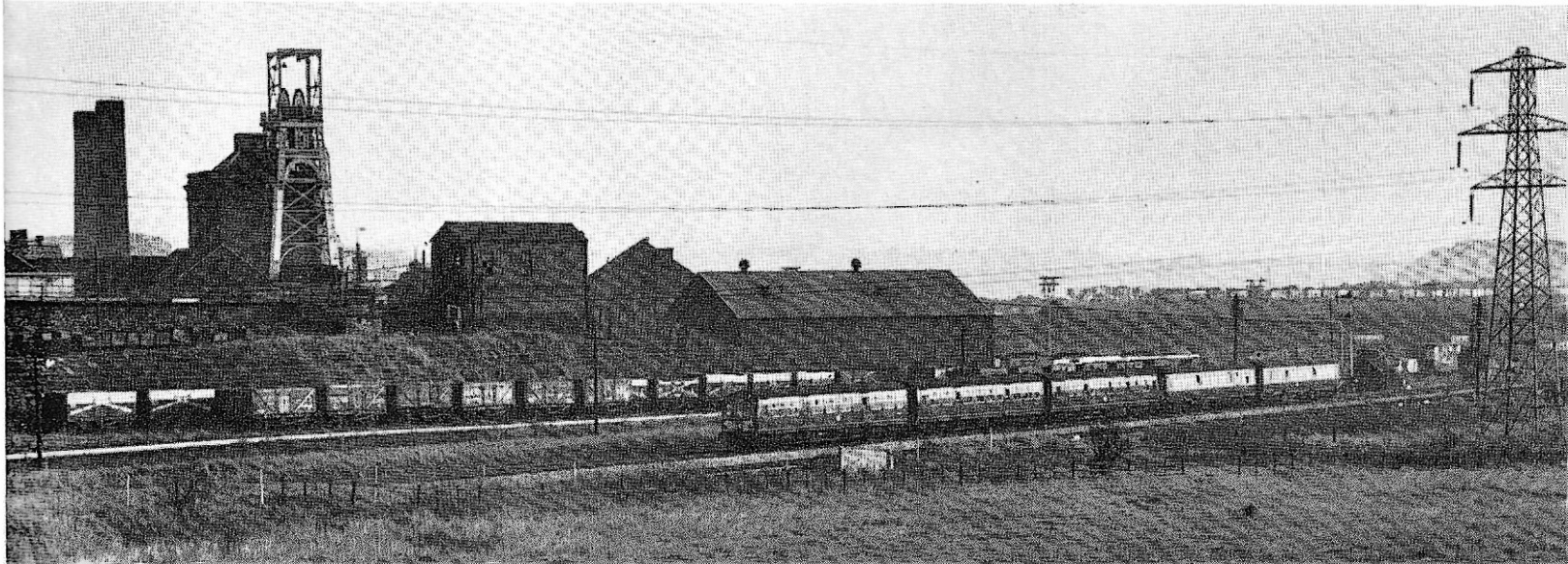
(To be concluded)

BR RATES AND CHARGES UP

FROM February 1 British Railways are increasing standard second-class return fares outside the London area by ¼d a mile to 3¼d, with comparable increases in first-class rates, and freight charges by 4 per cent. The rise in passenger fares has been tapered off according to distance. Outside the London area season tickets have been increased by 5 per cent. The BRB points out that this is the first general increase in ordinary fares for 2½ years and the first rise in freight charges for over 7 years. However, the *Financial Times* points out that since 1955 the standard second-class BR fare has now risen by 86 per cent from 1¾d a mile, and that season tickets have more than doubled in the London area and increased by about 86 per cent elsewhere, whereas the cost of living generally, based on an index of 1958=100, has risen by 29 per cent in the same period. The BRB claims that the fare and freight rate increases are based on the absorption of only one-third of the recent wage award, which is likely to cost BR about £30m in a full year. The rest, Dr. Beeching remarked in London at the beginning of January, will be absorbed "by our own harder efforts and with the help of the trade unions". He pointed out that in 1963 the deficit had been reduced by £22m in spite of a wage increase costing £20m and that preliminary figures for 1964 indicated a further reduction in the deficit of at least £15m, once more notwithstanding a wage increase costing about £20m.

STOKE DIESEL M.U. SERVICES

Above: Departure of a Derby-bound diesel multiple-unit from Stoke, with the Stoke Division's headquarters visible in the background. For the present the overall glass roof is being retained to avoid the high costs of removal.
Right: The interior of Stoke Station, with a Crewe-bound diesel multiple-unit at the north end.
Below: A down diesel multiple-unit near Trentham, on the main line from Stafford to Stoke. *Photos by C. T. Gifford*



Midwinter BR timetable changes are extensive

THE London Midland alterations from January 4 are on such a scale as to demand a closely-printed booklet of 135 pages. The Euston–Carlisle, Crewe–Holyhead, Llandudno–Blaenau Ffestiniog, Manchester–Oldham–Rochdale, Manchester–Stoke–Stafford (Sundays), St. Pancras–Barking (Sundays) tables, also the Scottish Region Carlisle–Glasgow and the summary West-to-North via Hereford tables, have all been reprinted in full.

West Coast Anglo-Scottish trains slower

The main line from London to Carlisle on weekdays is affected by the complete replacement of diesel by electric traction—with the sole exception of the "Royal Scot"—between Rugby and Crewe and by the fact that an average of 11min recovery time is allowed in all schedules between Carnforth and Carlisle for speed restrictions due to continuous rail-welding. With 5 or 6min extra between Carlisle and Glasgow for the same reason the overall times of the day trains between Euston and Glasgow are increased by 15min; the 10.00 "Royal Scot" reaches Glasgow at 17.25 instead of 17.10, and the 13.00 "Midday Scot" at 20.35 instead of 20.20. Coming south the 10.00 "Royal Scot" also is 15min later into Euston, at 17.25, but in order not to disturb the important Crewe connections the 13.30 "Midday Scot" is leaving Glasgow Central at 13.15, and getting into London at 21.00 instead of 20.55, a deceleration of 20min.

Of the Perth trains, the 10.10 from Euston is reaching Perth at 19.35 instead of 19.20; the 13.23 starts at 13.30, but is unchanged in timing from Carlisle onwards. By acceleration between Preston and London the 9.00 from Perth is still due into Euston at 19.10, though the 12.20 starts at 12.10 and does not reach Euston until 21.57, 7min later—a deceleration of 17min.

More time in Scotland for North-West businessmen

The down night expresses already had such ample recovery margins that their overall times have been but little affected; the 19.10 "Royal Highlander" is 11min earlier into Carlisle, at 1.10, and unchanged in arrival at Perth and Inverness; the 19.30 "Northern Irishman" is unaltered in its Carlisle arrival; and the 19.40 Perth is into Carlisle 7min earlier, at 2.07, but Perth 5min later, at 6.02. The later night trains, to Glasgow and Perth, have unaltered arrival times. In the up direction the 21.25 from Glasgow Central starts 20min later, but reaches Kensington Olympia at 6.28 as previously; the 22.45 "Night Limited" arrives in Euston 5min later, at 7.25, passing *en route* the 22.10 (previously 22.05) from Glasgow, which is 13min later into Kensington, at 6.58. The 21.00 from Perth is decelerated 7min to reach Euston at 7.32, but the "Royal Highlander", leaving Inverness at 18.30 instead of 18.00, is 8min earlier into Euston, at 8.02, a total acceleration of 38min. It is followed, instead of preceded, by the "Northern Irishman", which is not due until 8.15, 25min later than previously.

There are some important alterations in the day service between Manchester and Liverpool and Glasgow and Edinburgh, designed to give business executives more time for the transaction of their affairs without spending a night away. The former 9.43 and 9.30 from Liverpool Exchange and Manchester Victoria now start at 9.10 and 9.00 respectively and are into Glasgow Central at 14.20 instead of 14.50 and Edinburgh Princes Street at 14.21 instead of 14.50. The return evening service starts 1hr later than before, at 17.30 from Glasgow and 17.33 from Edinburgh, reaching Manchester 58min later, at 22.20 and Liverpool 71min later, at 22.25. In the reverse direction Scottish businessmen benefit by the 9.30 from Glasgow and Edinburgh both starting 60min earlier and being into Manchester 58min earlier, at 13.22 and Liverpool 45min earlier, at 13.05. Their return evening train starts 20min later from Manchester, at 16.50, and 5min later from Liverpool, at 16.40, and is 20min later into Glasgow and Edinburgh, at 22.00 (in the latter case Edinburgh Waverley, a including stop at Haymarket).

Electric traction speeds up Euston–Lancashire expresses

The high speed now possible with electric traction has resulted in acceleration of certain of the expresses between Euston and Liverpool and Manchester. The 7.45 from Euston starts at 7.50, changes locomotives on the through line at Rugby and is booked over the 75.5 miles from there to Crewe in 59min, at 76.8 m.p.h.—easily the fastest schedule over this section and also the fastest in Great Britain. The 10.30 from Euston to Carlisle starts at 10.35, and no longer has a through portion for Windermere. The 16.20 from Euston to Manchester is accelerated 13min to reach Manchester Piccadilly at 20.08. One or two other down expresses have been slightly accelerated. In the up direction the 8.40 from Carlisle, which during the last months of 1964 was started 20min earlier and held, first at Carnforth and later at Lancaster, in order to connect with the Workington portion of the 10.00 from Blackpool and so give a 1hr earlier arrival in London, has now reverted to a departure from Carlisle at 8.39, but is accelerated to reach Euston at 16.05, 15min earlier. This train also no longer carries a Windermere portion. The 14.05 from Liverpool to Euston starts 5min later, but arrives at 17.48, 2min earlier; several other up expresses have their times cut by 5 min.

On the North Wales service the 20.55 second portion of the "Irish Mail" from Euston, accelerated 22min between Rugby and Crewe by the change to electric traction, is 20min earlier into Holyhead, arriving at 2.20, only 15min after the non-stop 20.45 "Irish Mail". In the up direction the 0.55 and 1.10 "Mails" from Holyhead are due in Euston 10 and 15min earlier, at 6.05 and 6.25 respectively.

There has been a considerable acceleration of the 22.15 sleeping car express from Kings Cross to Aberdeen, which is now due at all stations from Inverkeithing onwards nearly half-an-hour earlier and reaches Aberdeen at 8.37 instead of 9.05. The changes in the working of the "Talisman" trains, made after the introduction of the winter timetable, are now permanent. The 16.00 from King's Cross is scheduled to cover the 232.3 miles to Darlington in 3hr 22min and, after calling at Newcastle (20.03/20.06), to run the 124.5 miles thence to Edinburgh in 114min. After an 8min stop at Waverley, the train continues to Glasgow Queen Street in 52min (the fastest time on record), arriving at 23.00. In the reverse direction departure from Queen Street is at 7.00, taking up from Edinburgh the normal 8.00 "Talisman" working. The afternoon "Talisman" makes three intermediate stops in its 6hr run from Edinburgh to Kings Cross—at Newcastle, Darlington and Hitchin—and is booked to cover the 124.5 miles from Edinburgh to Newcastle in 111min, and the 200.4 miles from Darlington to Hitchin in 174min, at 69.1 m.p.h.

Better East Coast–Highlands connections

With the closing of certain stations between Edinburgh and Perth there has been a substantial speed-up of this service, from 7 to 10min per train in each direction. The 14.03 Perth and 14.33 Dunfermline trains from Edinburgh change places, with the result that the Perth train, now 14.33, connects with the 8.00 "Talisman" from Kings Cross and still also with the 16.03 from Perth to Inverness, thus giving a new fast service from London and East Coast stations to the Highland line. The 16.15 from Edinburgh, with through coaches for Inverness, starts at 16.33, but with a Perth arrival at 17.54 still connects with the 18.08 to Inverness, arriving there at 21.15—an acceleration of 18min. The 17.33 from Edinburgh is accelerated by 17min to reach Perth at 18.54 Southbound, the 8.20 from Perth starts at 8.30, but still connects at Edinburgh with the 10.00 "Flying Scotsman", and brings Perth within 7½hr of Kings Cross, at a record average of exactly 60 m.p.h.

The southbound "Royal Highlander", which only recently was accelerated by 20min to leave Inverness at 18.00 instead of 17.40, now has had yet another 38min cut from its schedule by leaving Inverness at 18.30, being accelerated 18min to Perth, and the remainder south of that point. A retrograde step on the Highland line, however, is the withdrawal of the restaurant car from the down "Royal Highlander" and of the buffet car from the 8.15 from Inverness to Edinburgh. On the Oban line the 18.05 from Glasgow Buchanan Street to Oban now starts at 18.25 and reaches Oban at 22.15; the 18.22 stopping train from Glasgow to Callander starts at 17.50. Between Aberdeen, Elgin and Inverness, to compensate for the cancellation of certain stopping trains (following the closure of intermediate stations), all four 2½hr trains between Aberdeen and Inverness now call at Inverurie and Huntly in addition to Keith Junction, Elgin, Forres and Nairn. These additional halts have proved easily practicable without increase of overall journey time, and will be particularly useful to the town of Edinburgh via Carstairs are worked into and of the trains concerned. On Sundays all the

day and night trains between Carlisle and Edinburgh via Carstairs are worked into and out of Waverley station instead of Princes Street. On weekdays, the only corresponding working is of the 16.40 from Liverpool and 16.50 from Manchester already mentioned among the West Coast Anglo-Scottish alterations.

Grantham trains re-routed to Nottingham Midland

On the Eastern Region the 2.00 parcels train from Kings Cross now has limited accommodation for passengers as far as Grantham, calling at Hitchin, Huntingdon and Peterborough and arriving at 4.42. All trains between Grantham and Nottingham are running into and out of Nottingham Midland instead of Victoria station. On the Great Eastern Colchester main line most Sunday trains are allowed 10min extra, to cover speed restrictions due to extensive permanent way work. The weekday times are unaltered, however, for with the taking over by 2,750 h.p. Brush-Sulzer diesels of the principal trains from the English Electric 2,000 h.p. units, there is a more ample margin for the recovery of lost time, even on the tight Great Eastern schedules, and in the working books the recovery times have been increased with this object in view.

The Western's new January timetable

A new edition of the WR passenger timetable covering the period from January 4 to the introduction of the 1965 summer service on June 14 appeared shortly before Christmas. Countless alterations necessitating copious supplements had made last summer's edition, intended to run for 12 months, almost unusable by the autumn. Mr. Fiennes, the WR's General Manager, has courageously faced the facts and admitted the first 12-month book to be a failure in the circumstances prevailing and accepted the high cost of a fresh January issue as an unavoidable evil. The 12-month public timetable, a concept inherited by Mr. Fiennes from his predecessors, is sound in view of the high costs of new timebooks in printing, production and manpower; but it assumes a slower rate of change in services than was possible while re-shaping was still in progress, or management was directing that far-reaching changes, notably the 55 extra trains in the London suburban service, be introduced without undue delay. It works well in most Continental countries, even in Western Germany, where the current edition of the *Kursbuch* has been followed by minimal supplements despite mid-winter extension of electrification to Bremen.

In view of the little time available for preparing the new WR book, the compilers have done well to improve the cross-referencing between local and main-line route services; but the connecting services' arrival times in, and departures from, Paddington and other important stations are not shown in most branch tables—an austerity characteristic of GWR timetables and not, it seems, necessitated by lack of space. Lack of time, as the preface explains, has precluded restoration of mileages between stations, a feature requested by many of the public and useful in determining the fare; it is, however, to be included in next June's book. The bus information seems to be the same as in the previous issue. The pages designated "rail-road *link*" (our italics), which give some jejune information on bus access to places not directly served by rail, imply a greater degree of train-bus co-ordination than exists at present. Incidentally, the January edition contains 272 pages, compared with its predecessor's 400, mainly because of "Re-shaping". Possessors of the old book who surrender it, or its cover, can obtain a free copy of the new.

New Paddington–Ilfracombe service

The most interesting feature of the new timetable is certain new fast services to and from the West of England to come into force on May 24. From that date the 10.30 "Cornish Riviera Express", though continuing its Taunton and Exeter stops, will have no Torbay portion, but there will be a daily "Torbay Express" at 10.50, calling first at Dawlish, Teignmouth and Newton Abbot, reaching Torquay at 14.15 and Kingswear at 14.41, an acceleration of 17min. The return workings will be similar, with departures from Kingswear at 12.25 and Torquay at 12.53, a final stop at Dawlish, and Paddington reached at 16.15, 30min ahead of the "Cornish Riviera". The summer 11.30 from Paddington to Falmouth, also beginning to run on May 24, and booked to Plymouth in 4hr 5min, will stop intermediately at Exeter only (14.10/14.17) instead of Newton Abbot, and will convey a through portion for Ilfracombe instead of that formerly run to Torbay. The Ilfracombe section will be non-stop from Exeter to Barnstaple Junction and the time of 4½hr to Ilfracombe will be 21min faster than that of the former Southern Region "Atlantic Coast Express". In the reverse direction departure from Ilfracombe will be at 11.00, and after attachment at Exeter to the 9.20 from Falmouth (11.30 from Plymouth) Paddington will be reached at 15.35.

Between Paddington, Gloucester and Cheltenham some acceleration might have been expected as the result of the direct run through the new Standish Junction connection into Gloucester Eastgate and the avoidance of reversal there, but with the cancellation of a number of the stopping trains between Stroud and Gloucester some of the time saved is absorbed by additional stops at Stonehouse. Also the best train of the day from London, the 16.55 "Cheltenham Spa Express", now calls additionally at Swindon; it is 7min earlier into Cheltenham, however, at 19.18. In the up direction the overall time of the corresponding 8.10 from Cheltenham remains unchanged at 2hr 25min. To South Wales the recently inaugurated 10.00 from Paddington, calling at Slough and Swindon to Newport and principal stations thereafter to Swansea, gives an additional 2¾hr service to Cheltenham by connection at Swindon.

Slower from Paddington to Birmingham

With the additional "South Wales Pullman" service at 11.00 from Paddington to Cardiff the only gaps in the on-the-hour departures from Paddington to South Wales, between 8.00 and 20.00, are at 1.00 and 3.00, and the 3.00 departure is to be resumed on May 24. The up mid-afternoon "South Wales Pullman", at 14.30 from Cardiff, gives a new service to London by connection at 13.05, from Swansea, in 3¾hr. Most expresses from Paddington, Birmingham and Wolverhampton have their times extended by 2min extra allowed from Banbury to Leamington Spa, but there is no change in the reverse direction. London suburban alterations on the Western Region were dealt with in the last issue of MODERN RAILWAYS.

A WR "Warship" diesel-hydraulic emerges from Box Middle Hill Tunnel with a Paddington–Bristol express.
Photo by G. F. Heiron

Hymek Type 3 diesel No. D7047 pilots "Warship" Type 4 diesel No. D806 *Cambrian* out of Bristol with the Sunday 16.30 train to Paddington on June 2, 1963. *Photo by J. S. Whiteley*

Train Running and Traction Performance

Cecil J. Allen

ONE or two points arising out of recent letters from readers first need attention. In June of last year I argued that, with express passenger services in this country now turned over almost in their entirety to diesel and electric traction, and all the locomotives equipped with speedometers, the time had come when permanent way restrictions over curves might now be lifted to the maximum figure that the curve will safely bear, instead of allowances being made, as previously with steam power, for some under-estimate by drivers of the speeds at which they were actually travelling. This drew a comment from G. N. Martin, quoted in my September article, that he had noted numerous instances of diesel and electric drivers exceeding speed limits, and that in his judgment there was plenty of justification for maintaining these limits at the same level as hitherto enforced on steam power.

In this connection, by the way, it is interesting to note that in addition to the relaxation from 90 to 100 m.p.h. of the speed "ceiling" between Tallington and Stoke box and Grantham and Newark over the Great Northern main line, the limit has gone up to 80 m.p.h. between Wood Green and Hatfield, 90 over the site of the former Langley troughs and 70 over Stilton Fen from Holme to Yaxley. As yet, however, 60 m.p.h. remains the limit at Muskham, just north of Newark, even though the water-troughs here also have been removed.

Can the effect of p.w. checks be reduced?

I have since received a letter from J. A. Lord, who contends that considerable reductions could be made in the time lost by relaying slacks while still maintaining an adequate margin of safety. At present, he remarks, when a stretch of line is subjected to relaying or ballast-cleaning, a restriction of 15, 20, 25 or 30 m.p.h. is imposed until the work is finished. A certain period of time then elapses while the repaired track is being "run in"; then, after alignment and superelevation have been officially checked, the restriction is removed and full speed once again is authorised—a sudden jump, perhaps, from the speeds just quoted to 90 m.p.h. But why not begin to lift the restriction by stages immediately the work is finished —for so long, say, to 40 m.p.h., then for a short time further to 60 m.p.h., and finally to the full figure? The warning board indications would require corresponding alterations with each stage of the relaxation and also the weekly working notices, but the reduction in time lost by the slack would be of considerable benefit to operation during the period immediately following the completion of the track work.

Another possible gain that has often occurred to me would be if Chief Civil Engineers could content themselves with cutting the operation of the restriction to the length of track on which work is actually proceeding at any given time, instead of over a stretch of a mile or more in length. On the run of the up "Flying Scotsman" which I described in the November issue, when I rode in the driving cab of "Deltic" No. D9016 *Gordon Highlander*, we had a slack of this description past Chester-le-Street, rather more than a mile in length and throughout at 15 m.p.h., whereas work appeared to be in progress over no more than ¼-mile out of this distance. As we had to slow from 77½ m.p.h. to the prescribed minimum, I calculated the loss, notwithstanding the benefit of rapid "Deltic" acceleration, at fully 6min, which might have been cut by half had the restriction been of a length more proportionate to the work actually in hand.

I might add that on the run which I made a few weeks later up from Newcastle on the "Tees-Tyne Pullman", described later in this article, another "Deltic" covered the 7.2 miles from Birtley to Newton Hall Junction in 5min 26sec, as compared with the "Flying Scotsman's" 11min 47sec; allowing for the fact that the "Tees-Tyne" was doing 90 m.p.h. by Birtley as against the "Scotsman's" 77½ m.p.h., my calculation of 6min loss by the latter seems to be quite accurate. This may provide an answer to a letter from Frank Roebuck, who by some abstruse mathematical calculations attempted to prove that my allowance had been too generous. But he had made no allowance whatever for the fact that in addition to the time lost by the running at the restricted speed, further time is lost by reducing to the prescribed figure and still more by recovering from it.

One or two minor errors require correction in what I wrote in December concerning diesel operation in the Scottish Highlands. By a slip I described diesels Nos. D5359 and D5360, which respectively worked the trains in which I travelled from Glasgow to Oban and back, as being of the BR/Sulzer 1,160 h.p.

series, whereas, I am reminded by Brian Wilkinson, they are of Birmingham Railway Carriage & Wagon Co. manufacture, and of 1,250 h.p. Also I stated that the load limit for a Type 2 diesel west of Callander is 275 tare tons, but my correspondent tells me that this should be 300 tons, notwithstanding the long 1 in 60 climb from Balquhidder to Glenoglehead and the even worse 1 in 50 start out of Oban to Glencruitten crossing. However, this is cutting things pretty fine and I am not surprised to hear that in late September last a Type 2 unit, battling up from Oban in a heavy mist and on a greasy rail, stalled on this bank with a train of 307 tare tons.

A letter from S. C. Gray rebukes me for having suggested that time could be saved on the Glasgow–Oban journey of the 7.55 down if the through working between Edinburgh and Callander, which involves shunting movements at both Stirling and Callander, were abandoned. "Now we are to be turned out at Stirling!" he writes. "For shame!" But in view of the extremely poor Edinburgh connection, which involves a wait of no less than 63min at Stirling for passengers proceeding beyond Callander, I should have thought that he would be only too glad to seek solace in the Stirling refreshment room or elsewhere to while away this hour after his unconscionably early start as 6.50 from Edinburgh.

As yet I have not had a chance of travelling behind one of the Western Region 2,200 h.p. "Warship" diesel-hydraulic units over the Southern route between Exeter and London, but an interesting record has come to hand from B. I. Nathan of a run from Salisbury to Waterloo on one of the standard timings. It appears in Table 1: No. D818 *Glory* was at the head of a moderate load of ten coaches, weighing 350 tons gross. The point-to-point timings of this service seem somewhat uneven; those between Exeter and Salisbury are certainly more exacting than those east of Salisbury, save for the 27min allowance from Woking to Waterloo, which leaves little to spare. On this run the last-mentioned booking was barely kept, whereas between Salisbury and Woking the gains on the three stages were 4¼, 2¾ and 4min respectively—a total of 11min. With a clear road throughout, a late start of 24min from Salisbury was reduced to 11½min by the Waterloo arrival.

"Warship" on the Southern

The most obvious difference between diesel and steam haulage, as might be expected, was in the acceleration from starts and the uphill work. My correspondent had not previously recorded anything as fast as the 55 m.p.h. attained from Salisbury up the 1 in 169–140 to Porton; this was followed by an acceleration to 53 m.p.h. up the 3 miles at 1 in 178 of Enham bank, out of Andover; 10min 29sec for the 8.1 miles from Salisbury to Allington box, and 6min 58sec for the 5.25 miles from Andover to Hurstbourne, would both have been regarded as exceptional performances in steam days.

On the level and downhill, however, the diesel was held under considerable restraint; while the 71 m.p.h. attained after Andover up the continuous rise to Oakley was good, the tailing off of the speed to 65 by Worting Junction was indifferent, as also from 80 at Winchfield to only 68–72 m.p.h. for most of the way onwards to Woking. After Woking, again, some considerably higher speeds might have been expected with the train running well behind time. However, as far as Woking there was at least a fairly substantial reduction of the late start. Incidentally, I was not a little amused on Waterloo station recently to hear the station announcer apologising for the late arrival of a train from the West of England, but being most careful to add that it was "Owing to delays on the Western Region".

The Beyer Peacock diesel-hydraulic units of the Hymek type do not often get into these records, but a second log which I have received from Mr. Nathan shows that one of them can put up a performance fully equal to that of a "Warship", though rated only at 1,700 h.p. as compared with the latter's 2,200 h.p. Actually all the alternate numbers of the Hymeks, from D7001 to D7075 inclusive, as well as Nos. D7083, D7085 and D7087, have been derated from 1,700 to 1,350 h.p., but No. D7054, which headed this train, still had the 1,700 h.p. rating. The day was a Saturday in mid-July and the train was the 10.05 Torbay relief from Paddington, made up to 12 coaches of 410 tons tare and so packed with passengers as to bring the total load up to 450 tons. This train is on a "3-diamond" timing and so is allowed 110min start to stop for the 106.75 miles from Reading start to Taunton stop, as compared with the "4-diamond" 98min pass-to-stop schedule of the 10.30 and 14.30 down; the equivalent start-to-stop timing of the latter from Reading to Taunton would be about 100min, and this, as will be seen, the Hymek bettered with a gross time of 97min 39sec and a net of about 96min.

The performance of No. D7054, set out in Table 2, was uniformly good throughout, points of note, with a unit of this no more than moderate power rating, being the minimum speeds of 65 m.p.h. at Brewham and 74½ at Somerton tunnel; but for the easing over Grafton curve, after Bedwyn, no doubt Savernake summit would have been carried at 60 m.p.h. or a shade over. Maxima of 80 m.p.h. were reached at Lavington and in the dip before Somerton, and the highest speed attained was 85 m.p.h. at Curry Rivel Junction. This run suggests that the "second line of defence" in diesel power on more Regions than one is capable of handling "front-line" assignments at peak periods with competence. There have been similar happenings on the Eastern and North Eastern Regions when 2,750 h.p. Brush-Sulzer Co-Cos have been called on to replace 3,300 h.p. "Deltics".

A remarkable "Tees-Tyne" run

But when the full reserve of one of the highest-powered units is called into play, it is another matter. In the January issue I made brief mention of a run on the up "Tees-Tyne Pullman" on which, after a late start of 19min from Newcastle and the loss of some 16min en route by permanent way and signal checks, we actually passed Finsbury Park 2min early. Having so recently described a run of the up "Flying Scotsman" from Newcastle, I had not intended so soon to deal with another journey over the same course, but this one was so outstanding that I think the details ought to be made public without delay. The "Tees-Tyne" on this particular Monday morning was made up not merely to eight cars—one over the normal complement—but a bogie brake was attached in addition, making the total load up to 360 tons tare and about 375 tons gross. As I was in one of the Pullmans near the back of the train I did not get the number of the "Deltic" before starting and I have to confess with regret that I clean forgot to note the number after we had reached King's Cross. The 19min late start from Newcastle was due to the fact that the Gateshead depot staff had been having trouble with the steam-heating boiler. This run appears in detail in Table 4.

From the start it soon became clear that our London driver had every intention of making up the arrears of time. As early as Birtley speed was up to 88 m.p.h. and after the Durham slack and the 70 m.p.h. now imposed at Browney Colliery we reached 90 m.p.h. before the slowing for the Aycliffe curve. Notwithstanding adverse signals at the approach to Darlington, 5min were regained over this initial stretch and by smart station working here, recouping nearly another minute, we restarted from Darlington 13¼min late only. On the second fastest British scheduled run from here to York, there was some lively running, with the top speed just reaching 100 m.p.h. on the dead level at Alne; so the 44.1 miles from Darlington to York, including the 72 m.p.h. slack over Wiske Moor troughs, were run in 33min 48sec start to stop. York station staff also handled the train expeditiously and the non-stop run from York to London was begun 11½min behind time.

103 m.p.h. average for 15¼ miles

Soon after leaving York we suffered a bad relaying check to 20 m.p.h., at Escrick, and then, after 95½ m.p.h. had been reached at Balne, we got some unkind treatment through Doncaster, signal checks from Shaftholme Junction culminating in a near dead stand at Arksey. So, notwithstanding the 3min recovery allowance between Selby and Shaftholme, 3½min was dropped from York to Doncaster. There was a fine acceleration from 66 m.p.h. through Retford to 82 up the 1 in 178–200 to Markham summit; after this, despite a 25 m.p.h. permanent way slowing at Retford and a signal check beyond Claypole, by some more hard uphill running, with speed maintained at 82 m.p.h. up the 1 in 200 to Stoke summit, on passing Stoke box we had recovered all the time lost since leaving York. Now followed a most rousing descent

1 SR SALISBURY–WATERLOO

Locomotive: Diesel-hydraulic BB No. D818 *Glory* (2,200 h.p.).
Load: 10 coaches, 340 tons tare, 350 tons gross.

Dist.		Times	Speeds
miles		m. s.	m.p.h.
0.00	SALISBURY	0 00	—
1.10	*Tunnel Junc.*	2 47	44
5.45	Porton	7 47	55
8.10	*Allington*	10 29	63
10.95	Grateley	13 09	71/80
15.95	*Red Post*	17 01	71
17.35	ANDOVER	18 49	—
3.85	*Milepost 62½*	5 30	53
5.25	Hurstbourne	6 58	67½
7.15	Whitchurch	8 39	66
10.75	Overton	11 42	71
13.95	Oakley	14 21	69
16.05	*Worting Junc.*	16 12	65½
18.55	BASINGSTOKE	19 17	—
5.60	Hook	6 23	76½
7.95	Winchfield	8 11	80
11.30	Fleet	10 46	73½
14.55	Farnborough	13 23	71/68
19.80	Brookwood	17 48	72½
23.50	WOKING	21 52	—
2.65	West Byfleet	3 54	66½/70
5.20	Weybridge	6 07	68
8.35	Hersham	8 49	73
10.95	*Hampton Court Jc.*	11 08	68½
12.25	SURBITON	12 10	71
14.55	New Malden	14 07	65
17.10	Wimbledon	16 21	61
20.40	CLAPHAM JUNC.	20 09	*
23.00	Vauxhall	23 45	*
24.30	WATERLOO	27 13	—

2 WR READING–TAUNTON

Locomotive: Diesel-hydraulic BB No. D7054 (1,700 h.p.).
Load: 12 coaches, 410 tons tare, 450 tons gross.

Dist.		Times	Speeds
miles		m. s.	m.p.h.
0.00	READING	0 00	—
0.90	Reading West	2 39	—
1.85	*Southcote Junc.*	4 01	46
5.30	Theale	7 46	62½
8.80	Aldermaston	11 02	65
10.75	Midgham	12 49	66
13.55	Thatcham	15 23	66½
17.10	NEWBURY	18 33	68
22.50	Kintbury	23 13	70
25.55	Hungerford	25 56	*59
30.40	Bedwyn	30 37	65
34.10	SAVERNAKE	34 16	*57
39.35	Pewsey	38 50	78/71½
42.90	Woodborough	41 40	77
45.10	Patney	43 25	74½
50.90	Lavington	47 52	80
55.40	*Edington*	51 31	65
58.55	*Heywood Road Junc.*	54 27	70½
61.00	*Fairwood Junc.*	56 28	73½
64.25	*Clink Road Junc.*	59 19	67
66.30	*Blatchbridge Junc.*	61 05	71½
70.40	Witham	64 39	65
72.25	*Brewham*	66 19	62
75.70	Bruton	69 19	75
79.15	Castle Cary	72 48	*62½
86.20	*Charlton Mackrell*	78 22	73/80½
89.55	*Somerton*	80 53	74½
91.70	*Long Sutton*	82 35	79
94.80	*Curry Rivel Junc.*	84 49	85
		p.w.s.	*40
98.75	*Athelney*	88 56	—
102.00	*Cogload*	92 28	63
104.30	*Creech Junc.*	94 38	68
106.75	TAUNTON	97 39	—

3 ER GRANTHAM–KING'S CROSS

Locomotive: Diesel-electric "Deltic" Co-Co No. D9017‡.
Load: 13 coaches, 450 tons tare, 480 tons gross.

Dist.		Sched.	Actual	Speeds
miles		min.	m. s.	m.p.h.
0.00	GRANTHAM	0	0 00	—
3.35	*Great Ponton*	—	4 57	55
5.35	Stoke	5½	6 47	64
8.35	*Corby Glen*	—	9 00	94
13.20	*Little Bytham*	—	12 00	98
16.80	*Essendine*	13½	14 12	100
20.60	*Tallington*	—	16 32	102
23.55	*Helpston*	—	18 22	87
25.95	*Werrington Junc.*	20½	20 16	*60
29.10	PETERBOROUGH	24½	24 33	*25
30.45	*Fletton Junc.*	—	26 49	61
32.85	*Yaxley*	—	29 01	69
36.10	*Holme*	(†3)	32 01	*67
38.10	*Connington S.*	—	33 39	75
41.95	*Abbots Ripton*	—	36 46	74/86
46.60	HUNTINGDON	44½	40 11	83
49.50	*Offord*	—	42 27	*65
53.70	*St. Neots*	—	45 54	83
61.30	Sandy	56½	51 15	85
64.30	Biggleswade	—	53 17	86
68.35	*Arlesey*	(†3)	56 06	84
73.55	HITCHIN	68½	59 43	76
76.90	Stevenage	—	62 16	76
80.40	Knebworth	74½	64 47	81/86
85.15	Welwyn Gdn City	—	68 14	79
87.75	HATFIELD	80½	70 17	*62
92.75	Potters Bar	85	74 35	72
96.30	New Barnet	—	77 15	81
100.50	Wood Green	—	80 36	*
102.95	FINSBURY PARK	95	83 20	—
105.45	KING'S CROSS	100½	88 52	—

4 NER & ER NEWCASTLE–KING'S CROSS

Locomotive: Diesel-electric Co-Co Deltic (3,300 h.p.).
Load: 9 cars, 360 tons tare, 375 tons gross

Dist.		Sched.	Actual	Speeds
miles		min.	m. s.	m.p.h.
0.00	NEWCASTLE	0	0 00	—
0.60	*King Edward Bridge Junc.*	2½	2 55	—
2.60	*Low Fell*	—	5 00	77½
5.50	*Birtley*	—	7 04	88/85
8.30	Chester-le-Street	—	9 01	88/80
12.70	*Newton Hall Junc.*	—	12 30	*56
14.05	DURHAM	15	14 20	*30
15.05	*Relly Mill Junc.*	—	15 45	55/74
18.25	*Croxdale*	—	18 49	*70
23.20	FERRYHILL	24	22 36	83½
25.95	*Bradbury*	(†3)	24 39	85/90
30.65	*Aycliffe*	—	28 24	*60/72
			sigs	*24
36.10	DARLINGTON	40	35 04	—
5.15	*Eryholme*	6	5 58	88
10.35	*Danby Wirke*	—	9 23	95½
			troughs	*72
14.15	NORTHAL'TON	13	12 14	82
17.60	*Otterington*	—	14 26	90
21.90	THIRSK	18	17 09	92
28.00	*Pilmoor*	—	21 06	95½
32.90	*Alne*	—	24 07	100
38.55	*Beningbrough*	—	27 43	92

Table 4 (continued)

42.50	*Skelton*	32	30 33	*60
44.10	YORK	35	33 48	—
2.00	*Chaloners Whin Jc.*	—	3 45	*56
4.20	*Naburn*	—	5 54	*64/86½
			p.w.s.	*15
9.65	*Riccall*	—	12 07	72
13.85	SELBY	15	16 50	*40
18.40	*Templehirst*	(†3)	20 48	86½
22.25	*Balne*	—	23 20	95½
			sigs.	*20
27.95	*Shaftholme Junc.*	28½	28 44	—
			sigs.	*2
32.20	DONCASTER	33	36 37	—
			sigs.	*53
36.80	Rossington	—	41 08	—
38.65	*Milepost 149½*	—	42 47	69
40.45	*Bawtry*	(†1)	44 33	*38
44.20	*Ranskill*	—	48 15	80½/85
49.55	RETFORD	50	52 18	*66
54.40	*Milepost 133¾*	—	56 09	82
56.95	*Dukeries Junc.*	—	57 50	90
60.70	*Crow Park*	—	60 17	95½
			troughs	*64
68.05	NEWARK	65½	67 08	—
			p.w.s.	*25
72.80	*Claypole*	(†3)	72 03	83½
			sigs.	*50
78.45	*Barkston S. Junc.*	77	77 34	77½/83½
82.70	GRANTHAM	80½	80 49	*72
88.05	*Stoke*	85	85 08	82
91.05	*Corby Glen*	—	86 51	102½
95.90	*Little Bytham*	—	89 42	105
99.50	*Essendine*	93	91 48	100
103.30	*Tallington*	—	93 58	98
108.65	*Werrington Junc.*	100	97 48	*60
111.80	PETERBOROUGH	104	101 53	*20
113.15	*Fletton Junc.*	—	104 02	55½
115.55	*Yaxley*	—	106 00	83½
118.80	*Holme*	(†3)	108 46	*69
124.65	*Abbots Ripton*	—	112 50	90
129.30	HUNTINGDON	123½	115 50	95½
132.20	*Offord*	—	117 57	*72
136.40	St Neots	—	121 08	88
144.00	Sandy	135½	126 03	90/88
147.00	Biggleswade	—	127 59	90
151.45	*Three Counties*	(†3)	131 33	94
			sigs.	*2
156.25	HITCHIN	147½	136 55	—
159.60	Stevenage	—	140 10	72
163.10	Knebworth	153½	142 39	90/94
166.15	Welwyn North	—	144 35	90
			p.w.s.	*22
170.45	HATFIELD	159½	148 42	60
175.45	Potters Bar	164	152 59	83½/95½
179.00	New Barnet	—	155 33	85
183.20	Wood Green	—	158 40	*64
185.65	FINSBURY PARK	174	160 17	—
			sig. stop	*0
188.15	KING'S CROSS	179	171 15	—

* Speed restriction. † Recovery time (min.). ‡ Name: *Durham Light Infantry.*

of Stoke bank, with an average of 103.4 m.p.h. maintained over the 15.25 miles from Stoke to Tallington and a top speed of 105 m.p.h. By Peterborough all but 10min of our late start had been recovered, notwithstanding the delays we had suffered to this point.

But the most brilliant running still lay ahead. Up the 4½ miles of 1 in 200 up past Abbots Ripton we forged our way without the speed at any point falling below 90 m.p.h.; a brief 95 through Huntingdon then preceded the 72 m.p.h. Offord curve slowing. From 88 to 90 m.p.h. was sustained from St. Neots to Biggleswade and Sandy was passed with the Pullman now no more than 2min behind time. Through Three Counties our "Deltic" was doing 94 m.p.h., but just when we had a certain prospect of passing Hitchin ahead of time, we were all but stopped by an irritating signal check at Cadwell. Nothing daunted, the "Deltic" accelerated up the 1 in 200 to 72 m.p.h. before reaching the summit at Stevenage; then followed 90 m.p.h. by Knebworth and 94 before yet another severe slack for relaying, before Hatfield. After this the proceedings were exciting indeed as, with a somewhat liberal interpretation of the speed rubrics, we touched 95½ m.p.h. through Hadley Wood and continued at well over 80 m.p.h. until slowed at Wood Green tunnel. Astonishing to relate, after the 19min late start and delays which between them had cost fully 16min—1min Darlington; 2min Escrick; 5¼min Shaftholme–Doncaster; 2min Newark; ¼min Hougham; 3½min Cadwell; and 1¾min Welwyn Garden City—we swept through Finsbury Park 2min early.

And then—need I say it? A dead stand of just over 2min at Belle Isle, and an arrival in King's Cross all but 4min late! It would be difficult to imagine anything more discouraging to a keen driver than this final delay, which, because of the very slow approach to the signal stop, cost fully 6min. Well, the 188.15 miles from York to King's Cross had been run in 171min 15sec, or 152¼min net; the 155.95 miles from Doncaster in 134min 38sec, or 120½min net; the 105.45 miles from Grantham in 90min 26sec or 79¼min net; and the 76.35 miles from Peterborough in 69min 22sec or 58min net. Had the train been non-stop from Darlington, the net time would have been not more than 184½ or 185min; and had it been a non-stop run from Newcastle, with such running as this and no out-of-course checks, a net time of 215 or 216min would certainly

have been possible. And yet there are die-hard steam addicts who still claim that the substitution of diesel for steam power has not brought about any advance in British rail speeds!

Incidentally, the most outstanding record that I can trace as having been made with steam power on the up non-stop "Coronation" was on an occasion when the A3 Pacific *Singapore*, No. 2507, was commandeered at short notice at Newcastle to replace an A4 streamliner which had failed and succeeded in working the flyer up to King's Cross in 227½min, or 222½min net. This was in the month of March, 1939, when the "Coronation" would be running without the observation car and thus would have a tare load of 289 tons, or about 305 tons gross. Oddly enough, on another day in the same month a similar failure resulted in A3 No. 2595 *Trigo* having to take over and the latter did almost as well with a time of 229min gross and 225min net. There can be little doubt that both these Pacifics must have been worked extremely hard to achieve such times and the fireman's task on both would hardly have been enviable; whereas the "Deltic", with 45 tons more of train and a shorter net travelling time, could have continued at such a speed indefinitely without imposing any strain on the crew or any undue stress on the power plant.

105 miles in 89min with 480 tons

When we come to Table 3, however—another run for which I am indebted to B. I. Nathan—we see that a "Deltic" can make times nearly as fast with a 13-coach load of 450 tons tare and 480 tons gross. The train concerned was the up "Heart of Midlothian", and a late start from Grantham of 5½min provided a modest incentive to hard running. Up the 1 in 200 to Stoke there was an acceleration to 64 m.p.h., though this was not enough by 1¼ min. to keep the completely impossible 5½ min booking for this climb. Then the authorised 100 m.p.h. stretch was taken at about this maximum, but darkness and continuously welded rail gave my correspondent some difficulty in recording the speed with precision; from the passing times I have estimated the probable speeds that were being maintained. The timing of 24½min to Peterborough is very tight for a load of this magnitude and none of the arrears was recovered on this initial stage. Then, with the help of two recovery allowances, time regaining began.

The acceleration after Holme was not as rapid as usual, which explains no higher rate than 73–74 m.p.h. up Abbots Ripton bank; but to accelerate from 65 m.p.h. at Offord up the rising grades to 83 by St. Neots was good work. Then followed 83–86 m.p.h. all the way from here on to Three Counties, with a sustained 76 m.p.h. up the 1 in 200 from Hitchin to Stevenage. Not a single check was experienced and the clear road into the terminus that this express usually *does* get, in my experience, was obtained once again. So the run of 105.45 miles, beginning 5½min late, finished 6½min early, in a total time of 88min 52sec. I do not think it would have been possible for any A3 or A4 Pacific to have made such a time with a trailing load as heavy as 480 tons.

Without setting out the run in detail, I might conclude by saying that my down journey to Newcastle, from which I returned on the "Tees-Tyne Pullman", was made on the 11.00 Glasgow express from Kings Cross and was another "Deltic" *tour de force*. This time it was behind No. D9008 *The Green Howards* with a packed 13-coach train of 460 tons tare and not far short of 500 tons gross. We lost 9min by a whole succession of signal checks, including a stop, between Knebworth and Hitchin, but kept time to Peterborough, 76.35 miles in 73min 36 sec, or 64½min net. Between Peterborough and Doncaster a permanent way check beyond Essendine cost 3min and another beyond Newark 2min, but this stretch of 79.6 miles was covered in 74min 58sec or 70min net instead of the 78min allowed. Doncaster succeeded in holding the train for 12½min instead of the 3min booked and a long permanent way slowing at Escrick made it impossible to regain any minutes between Doncaster and York; this 32.2 miles, very sharply timed in 33min, took 34min 40sec or 32min net.

The most brilliant running was from York to Darlington; a top speed of 95½ m.p.h. was reached on the level and Croft Spa, 41.55 miles, was passed in the remarkable time of 31min 51sec, against the gradual rise in this direction; but for a 5 m.p.h. signal check Darlington would have been reached in 35½min instead of the 40min booked. From here we were only 2min late away and certainly would have reached Newcastle on time had we not been stopped on the King Edward Bridge to allow the up "Heart of Midlothian", running late, to vacate our platform. Total net gains to locomotive on this trip, even with 500 tons of train, thus worked out at 23min; and with the "Deltics" this kind of thing is by no means of infrequent occurrence.

National traction plan—or poll?

by our Engineering Correspondent

LAST month's outline of the BRB's National Traction Plan read encouragingly at first, with its emphasis on precise evaluation of types and the numbers of each that will be needed in the future. But further reflection leaves one feeling that the only thing precisely spelled out was the identity of the officer who has initiated it on the Board's behalf.

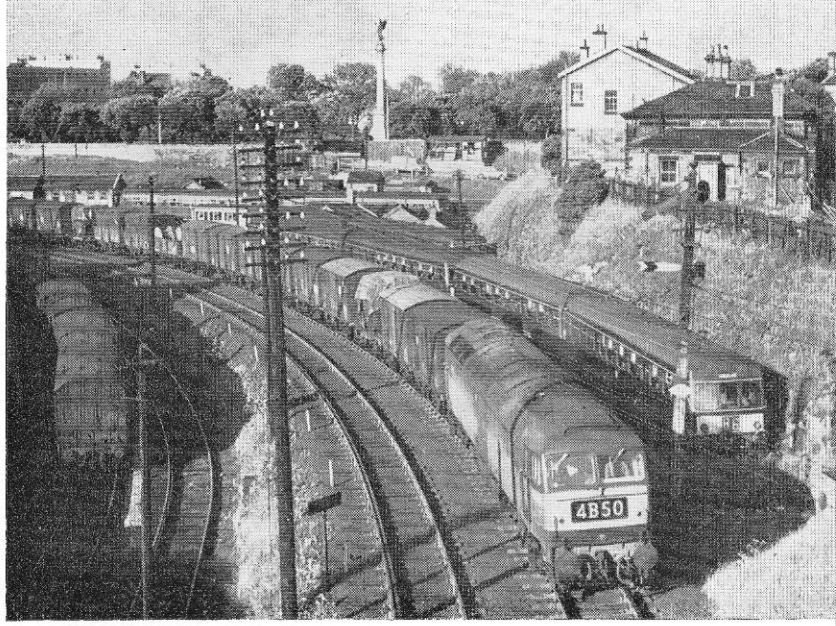
Precise assessment of requirements starts with precise evaluation, in precise mathematical terms of ton-miles and speeds, of the job to be done. The locomotives are then designed so that all duties can be covered by a range of types which represents the best compromise between two conflicting ideals—one type that can flexibly fulfil all duties and be economically diagrammed; and different types for each duty, ideally matched to its needs.

British Railways certainly did not acquire its heterogeneous collection of locomotive types by any such rational process. But they now exist and it remains to make the best possible use of them. This, too, is arrived at by a rational process, worked out mathematically with considerable precision. It has little to do with the manifold opinions which seem to govern the locomotives' present use. What purpose will be served by gathering together these opinions and then choosing one for universal imposition seems a little obscure—unless it can be to make invidious comparisons impossible.

In the early days of BR diesels there might have been some excuse for failure to understand that this is a matter of pure mathematics, but reason should have dawned by now. Has it? On how many diesel locomotive duties today are loads and timings worked out by simple arithmetical process from basic information about locomotive, train and route? Precious few, one fancies; but without that there can be no common objective standard of use. All we shall have will be an assessment based on the individual states of the livers of one or more drivers on "test" runs and of those who were watching them, followed by some kind of judgment owing a great deal to the collective state of all drivers' livers, as expressed in their maintenance or otherwise of the timings which were arrived at as a result of the initial tests.

Given precisely calculated timings, the rest of the job is equally simple in principle, although tedious in practice. And this is really the whole point. The job of conceiving and putting to work economically a fleet of locomotives is from beginning to end tedious. There are no short cuts—except to the wrong answer. If BR have missed out some of the steps, the only thing to do in reason is to go back. Merely to take a consensus of present malpractices is not going to be much help.

focus

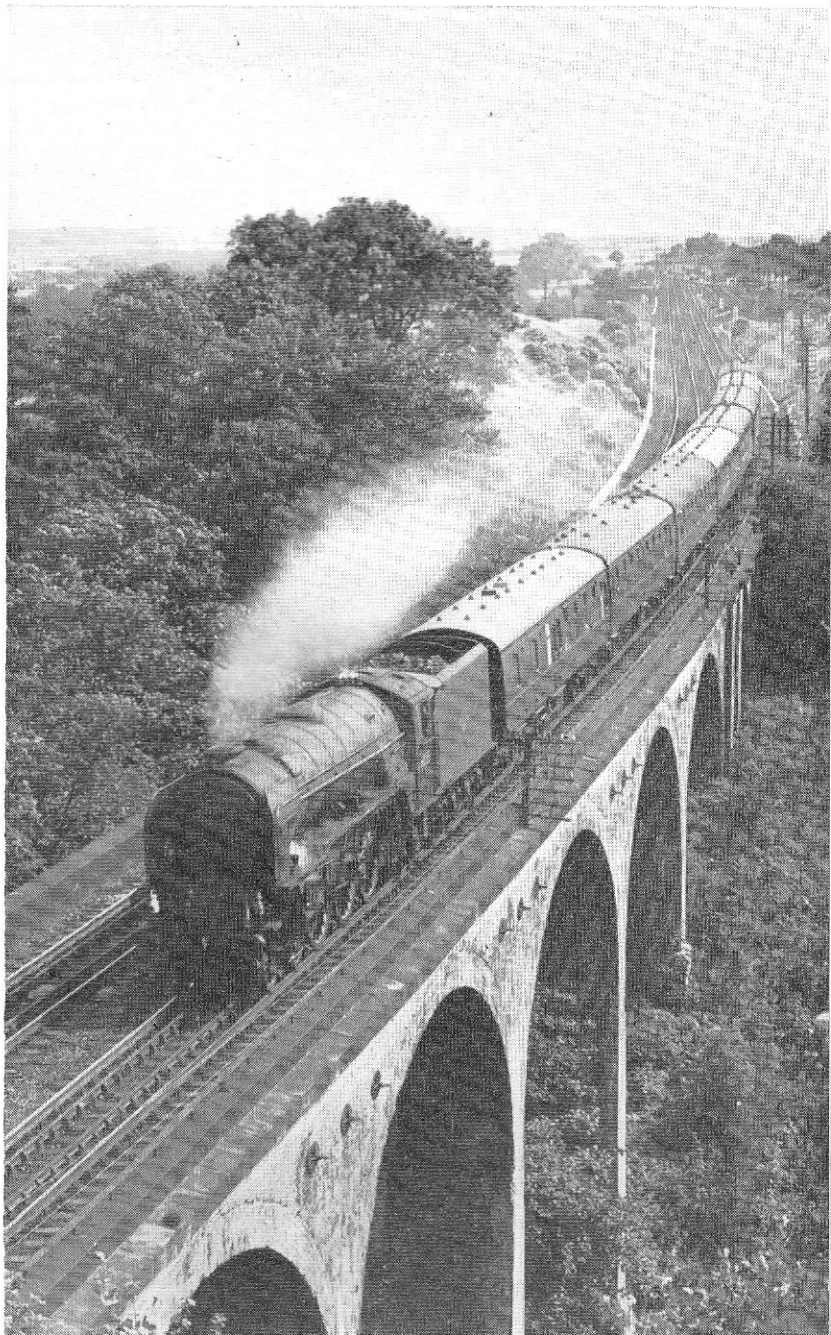


Above left: North and southbound freights, headed by English Electric Type 1 diesel No. D8130 and Class 5 4-6-0 No. 45136, meet in Drumlanrigg Gorge, on the Scottish Region's Nith Valley line, on July 4, 1964. *Photo by Derek Cross*

Below left: Another view in Drumlanrigg Gorge on July 4, with a Glasgow–Blackpool train headed by BR/Sulzer Type 2 diesel No. D5133 and "Jubilee" 4-6-0 No. 45627 *Sierra Leone*. *Photo by Derek Cross*

Above right: Brush Type 4 diesel No. D1573 climbs the 1 in 78 out of Sunderland to Fawcett Street Junction with the evening Wearmouth–York Dringhouses freight on June 10, 1964. *Photo by I. S. Carr*

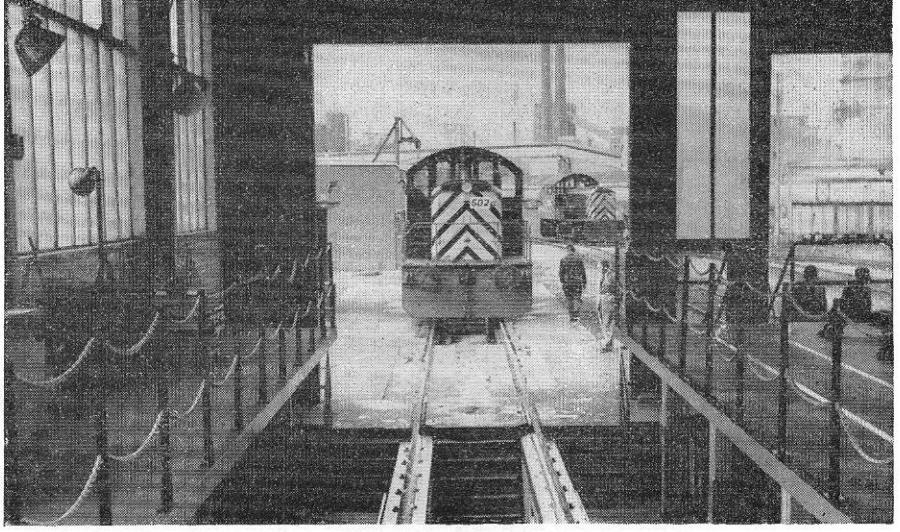
Below right: Class A1 4-6-2 No. 60155 *Borderer* crosses Plawsworth Viaduct, near Durham, with a northbound express on August 1, 1964 *Photo by A. D. Thompson*



FOCUS concluded

Right: WR 2-8-0 No. 3361 approaches Church Stretton with a southbound North-and-West route freight on January 25, 1964. *Photo by P. Riley*

Below: Another WR 2-8-0, No. 2898, approaches Reading West with an up freight on May 9, 1964. *Photo by Brian Stephenson*



A 300 h.p. Brush diesel-electric 0-4-0 at the entrance to the Steel Company of Wales' diesel maintenance depot.

OPERATING A STEELWORKS DIESEL FLEET

EXPERIENCE with a fleet of 39 diesel-electric shunting locomotives at the Port Talbot works of The Steel Company of Wales was described by Mr. R. T. Ribbons, locomotive engineer of the company, in a paper presented to the Institution of Locomotive Engineers at the end of 1964. The duties undertaken range from general shunting to propulsion of specialised steelworks trains of up to 1,700 tons on the level, and of 1,000 tons on gradients as severe as 1 in 70 for half-a-mile. After purchasing five American locomotives of 660 h.p. in 1950, on the grounds that they were a well-tried design available for quick delivery, the company turned to British suppliers in subsequent years for 0-6-0, 0-4-0, and Bo-Bo designs, the largest being of 515 h.p. More recently some of the 515 h.p. engines have been uprated first to 660 and then to 750 h.p., and in the last two years equipment has been added to enable these uprated locomotives to work in tandem with a 390 h.p. four-wheel (uncoupled) type to give a combination of 1,140 h.p. with a weight of 190 tons.

The first British locomotives, similar in layout to the basic design of the BR diesel-electric shunter, had teething troubles to which their well-proven American predecessors were not liable, and their crews found the cabs by comparison cold, cramped and affording a poor lookout. Cab heaters, improved windows and mastery of the teething troubles in due course earned them popularity and early mistakes have been avoided in the specifications for subsequent types. From the men's point of view a comfortable locomotive is a good locomotive, and sometimes management does well to accept the same philosophy. A proposal to dispense with forced ventilation of the traction motors in one locomotive design was not proceeded with, partly because some of the blower output provided warmed air for the cab. Electrical transmissions have been most reliable. Mr. Ribbons said in the discussion that they had been quite happy with this form of drive and if manufacturers would adopt the idea that it should be looked after by a mechanical man they would be happier still. Among engine problems, the biggest and most costly has been the attack of cylinder liners by the cooling water. Careful study has formed the theory that this is a vibrational problem and that the amplitude of the liner vibrations is directly connected with the rate of attack. Development is proceeding on cushioning piston slap by arranging for an oil belt to surround the main column of the piston.

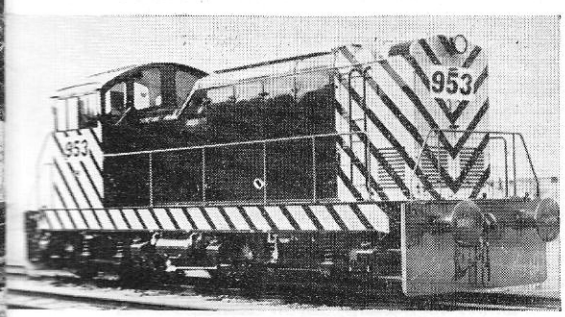
The conclusion of the paper described the development work which has been done in applying semi-conductor devices to various functions in the locomotives. One modification was the use of a thyristor circuit to control generator excitation. This came about when the cables to the original control resistors at the back of the cab needed replacement. A standard commercial electronic unit for battery vehicle speed control was bought and installed to replace the locomotive drum controller. This provides a continuously-variable current by rotation of a small potentiometer. In the modified locomotive the controller handle adjusts the diesel engine speed as before, but instead of simultaneously controlling the generator excitation through the drum contacts and resistances, it now does so by means of the potentiometer, to which its shaft has been linked by a rod. Very fine control at low speeds is given by this arrangement.

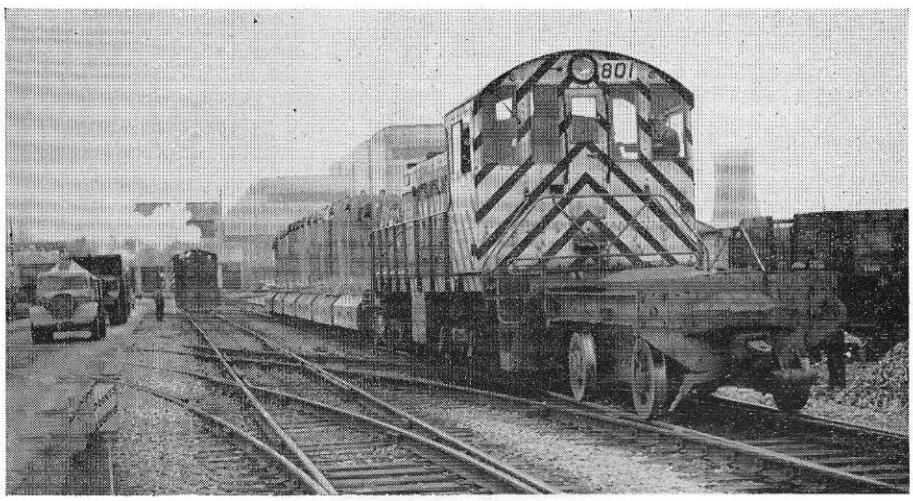
In the future, Mr. Ribbons thought that the advent of the semi-conductor might change the whole approach to electrical transmission and its control. It might well mean the total disappearance of the expensive direct current machine, the reverser and the drum controller, with their maintenance requirements. The alternator, the squirrel cage motor, the thyristor and the gate-controlled switch were all rugged equipments which required little attention. His forecast was answered by the first speaker in the discussion recalling that an electronic regulator was now being introduced for main-line locomotives, and in addition to controlling excitation like the present automatic load regulators, would initiate weak-field operation of the traction motors.

Another contributor mentioned a prototype electronic governor for main-line service, but expressed doubts as to whether electronic equipment could be successfully "tractionised". Mr. Ribbons' own experience to date has been that with resilient mounting of the apparatus and sealing of terminal nuts, electronics can be installed in locomotives with some confidence of "fit and forget". His ideal would be routine servicing by one class of tradesman as is the practice with motorcars, electrical technicians being necessary only at the base workshop to overhaul exchanged components of the plug-in type.

Left: One of the 660 h.p. Brush diesel-electric Bo-Bos operated by the SCoW.

Right: A 660 h.p. Alco diesel-electric Bo-Bo hauls an ingot train from Abbey Works to Margam Works.





today and tomorrow

LINER TRAINS AND SINGLE MANNING ARE KEY ISSUES

ANY hope that the first Liner trains would start running early in 1965, as had been hoped, was dispelled in a Parliamentary answer late in December by the Minister of Transport, who remarked that the BRB now hoped to initiate the scheme this summer—but provided that early agreement could be reached with the unions on the "free depot" principle. Mr. Fraser disclosed that of the £6m Liner train expenditure authorised by the previous Government, £700,000 was spent in 1964. Earlier, at the Railway Staff National Tribunal's hearings of the railwaymen's pay claim, Mr. A. R. Dunbar, Member of the BRB, had voiced the BRB's concern that, despite protracted and patient negotiation and the Board's fresh proposals "with every possible protection for the individual", neither Liner trains nor more comprehensive single-manning of locomotives had made headway.

Plainly the Board now regards progress on these two issues as of equal importance and is seizing every opportunity to advance its case on single-manning. This was apparent in the negotiations to end the recent go-slow of SR South-Eastern Division motormen, who were seeking a special bonus of three guineas a week on the grounds that their peak-hour work entailed special responsibility. Their real grievance, however, was undoubtedly that some colleagues on lower category jobs were taking home more money because they were involved in work study bonus schemes—for example, on local trip freight working. This could lead to the anomaly of a demotion for disciplinary or other reasons bringing higher monetary rewards. The motormen undoubtedly had a good deal of sympathy, but the BRB takes the view that enginemen's bonuses can only be discussed from a national standpoint and that any negotiation on this issue must examine ways of raising productivity. Single-manning is obviously the method the BRB has chiefly in mind, but the NUR is averse to amending the present agreement, while the ASLEF is reported to be seeking a return to more double-manning. Neither union wants to see bonus schemes in any way dependent on single-manning. ASLEF hopes that some other means can be found to measure an engineman's productivity and will presumably point to schemes of the kind practised on the SNCF, which take account of such achievements as time regained and fuel or current saved. At a meeting of the Railway Staff National Council presided over by Dr. Beeching after the Tribunal's award on the railwaymen's pay claim the unions agreed to further talks on both issues, and as we went to press fresh proposals on the bonus issue had been put to the NUR and ASLEF by the BRB.

The pay rise

The decision of the Railways Staff National Tribunal on the disputed railwaymen's pay claim was announced on December 14, and is now accepted by the unions. Operating grades, numbering about 250,000, receive a rise of 9 per cent. supervisors 5 per cent and clerical staff 4 per cent. The minimum rate of the lowest grades will increase by 17s to £10 11s for a 42hr week. The total cost to BR, now that the increases have been extended to workshops staff, is expected to be £30m in a full year. The Tribunal's decision was influenced by the Guillebaud principle of comparability with other industries, but it also emphasised that the future development of the railways depended on greater productivity and urged improvements in the efficient use of manpower and equipment. In a statement the BRB said the award clearly intensified the already heavy financial burden upon British Railways and indicated the country had a right to expect improved productivity. Only by these means would BR be able to absorb the bulk of the additional costs and keep to a minimum increases in fares and charges, or the cost of subsidised losses, which would otherwise fall upon the public. Mr. Sidney Greene, General Secretary of the NUR, said his union would co-operate in measures to raise efficiency if they received the reasonable safeguards (redundancy, etc.) referred to by the tribunal. It was these and not the pay increase that would make a difference to his members' attitude.

Staff relations on BR

"Staff-Management Relations on British Railways" was the theme for a discussion group recently organised by Leeds University Union Railway Society. Speaking for BR, Mr. S. J. Judson, Chief Establishment Officer of the NER, claimed that present-day relations between the two sides were extremely good and a great improvement on the past. Nowadays union negotiators were more skilled and far-ranging in outlook, whereas in days gone by they often refused to discuss more than the purely local, short-term effects of any proposal. This was one of the milestones in railway industrial relations. Mr. J. Nicholson, the NUR's Area Organiser, agreed that the negotiating machinery was "second to none", but its weakness from his point of view was that, whatever the men might say about a proposal, they could do nothing to alter it. On occasions, in fact, he had been told quite bluntly that "We have the right to do this, whatever you say about it." He stressed that his primary concern was the welfare of the workers, not with that of the railway system as a whole, which was the management's concern. He thought that Dr. Beeching was doing a far worse job than Lord Stamp of the LMR, who, he said, had set out to make a profit rather than to cut his losses.

Morale among railwaymen, even in the salaried grades, was at a low ebb, he alleged, and fear of the future was not a good climate for co-operation. Nevertheless, Mr. Nicholson conceded that the BRB was quite reasonable in cases of hardship. Asked whether low morale might not be the cause of the present increase in accidents to railwaymen, Mr. Judson thought this was unlikely, although there might be some connection. Most accidents occurred to men working on the track and were caused by lack of vigilance. The job of management was, first, to discover why men lost their interest and therefore their vigilance, and second, to create conditions in which accidents could not happen. For this purpose the NER had a man at York and four others at work in different parts of the Region. A new form of accident report had been evolved, which probed deeply into the circumstances of the accident and into the man's background, in an attempt to reveal why he made his fatal move. Proper initial training and subsequent refresher courses were important to maintain a man's interest in his job, but in the past this aspect had been largely neglected. Here the NER, at least, was now making up for lost time. Mr. Nicholson wondered whether the incentive bonus scheme was not making men take unnecessary risks. He also drew attention to the small size of today's permanent way gangs, in which all the men might be working at once and nobody was keeping a proper watch for trains He suggested it might be worth while paying an extra man to act as look-out. However, today the widow did receive a payment from BR automatically and did not now have to prove negligence. Questioned on union attitudes to Liner trains, Mr. Nicholson opposed the lack of a guard and the principle of the open terminal. He stressed that he wanted these disagreements settled, but in a way beneficial to both the workers and the industry. He was particularly concerned not to eliminate the guard, who had certain protective functions which could not be carried out by the second man on the locomotive.

BR withdraw more fare concessions

Various alterations in BR passenger charges (other than ordinary and season ticket fares) effective from January 1 include introduction of a new basis for party fares and abolition of a number of concessions that the BRB considers outdated in present circumstances, which include the much greater availability of road transport. Moreover, potential users have seldom or never availed themselves of many of these reductions in recent years. Their withdrawal greatly reduces administrative costs, such as printing the conditions and accounting. The new party travel arrangements, in essence, afford greater pricing flexibility relative to the size of the party and the time of travel; moreover, travel agents have been given scope to foster and organise party rail travel. This is welcome news, yet the Board had made no general announcement at the time of going to press and those interested were left to learn the news through brief reports in the daily papers and from travel agents. It seems strange that when BR has something pleasant to offer—or when, as in the case of the recent London fare application, there are risks of serious misunderstanding—it does not cry its wares. One of the more important reductions in concessions was in that granted to Servicemen and women travelling on leave at their own expense: from five-sevenths to three-quarters of the ordinary fare. This may not be a large

amount, but a change affecting hundreds of thousands of rail users and of considerable interest to many of the general public was worth more, one would have thought, than a bald notification before Christmas to the Ministry of Defence. Among the more specialised concessions withdrawn are those to grooms accompanying horses, regimental bands travelling to functions etc., commercial travellers and sports clubs—all of whom now tend to travel by road. Withdrawal of "free trucking" (free conveyance of scenery, properties etc.) for theatrical companies has caused some resentment, largely as a result of sheer conservatism and failure to realise BR's new role in the national economic life.

BR "true costs" not entirely discredited

Despite the latest onslaught on the BRB's calculations of the relative "true costs" of road and rail trunk freight transport by the Transport Holding Co., which MODERN RAILWAYS summarised last month, points of the BRB case remain unchallenged. It must be remembered that so far every critic has sought to project the BRB arguments from their chosen base of trunk roads only to an examination of the cost of the country's entire road system. The BRB was concerned to make a comparison between the true costs of trunk haulage by Liner train over modernised main lines as against those of road transport on parallel motorways and dual carriageway trunk roads, not between any other types of rail and road transport. In the December 12 issue of *The Economist*, a correspondent remarked that while the BRB might wish they had not produced their argument in its original terms, their main point was nevertheless worth making. All attacks continued to assume that a dual carriage motorway with three 12ft-wide lanes on each side would still be built even if it was carrying nothing heavier than a 30 cwt. motor vehicle. This, he suggested, was highly debatable. Lanes were multiplied to allow for the variation in speeds of different types of vehicle. The heaviest road vehicles were usually the slowest and if they were absent each carriageway of a motorway could probably do with one lane fewer. Moreover, would it be necessary to make each lane as wide as 12ft if the motorway had to carry no large lorries or buses? From known motorway costs, *The Economist* calculated that with these economies the cost per mile of a motorway might be brought down from over £700,000 to about £370,000 if it were designed exclusively for light traffic. On the fair assumption that maintenance and other overhead costs should be allocated proportionately between heavy and light vehicles and not to all vehicles on an equal basis, but accepting all the other criticisms made by the Transport Holding Co. of the BRB approach, *The Economist* found that there might be a case for increasing lorry taxation on motorways and dual carriageway trunk roads by 10 to 15 per cent.

Top engineering changes on British Railways?

Important changes at the top of BR engineering are believed to be imminent. It is reported that the BRB posts of Chief Mechanical Engineer and Chief Electrical Engineer are to be merged into one office, and also those of Chief Civil Engineer and Chief Signal & Telecommunications Engineer. This would reduce the chief engineering posts at BRB headquarters to two.

No BR wish to make for export

A *Times* report that the BRB had made representations to the Minister of Transport seeking authority to manufacture not only wagons but even locomotives for export in BR workshops is categorically denied by the BRB. This suggestion followed the expected reversal by the Minister of Transport of the last Government's policy of restricting BR workshops to the manufacture of rolling stock and equipment destined for BR ownership. The workshops will now be allowed, for example, to tender for oil companies' tank wagon orders and privately-owned containers to be conveyed on Liner trains, from which they were previously barred. The Government's decision has obviously disconcerted the private wagon-building firms, many of whom have been seriously affected by the drastic reduction of BR wagon stock, but so far as locomotive construction is concerned it seems unlikely to have any significant effect on the existing balance of work between BR workshops and private industry. As for exports, new legislation would in any event be needed to allow BR to sell equipment abroad. But, in the unlikely event of it being brought forward, bearing in mind the successful partnerships that have been formed between private firms to pool resources and avoid fratricidally competitive bidding abroad, the co-operative involvement of BR in one or other of these consortia seems far more likely than rivalry.

End of station time sheets

With the possible exception of some suburban and local service displays, passenger timetable sheets will no longer be displayed at stations in any Region of BR after next June, when the current timetable expires. On the WR at least, the publication and display of these sheets was ended some time ago. Platform departure sheets and train indicator displays at the larger stations, of course, are not affected. The BRB says that the availability of free leaflets summarising individual services is to be increased at most stations. Additionally, it points out that Regional timetables are available for consultation at enquiry offices and booking offices and also for sale.

No coal movement crisis

So nicely adjusted is the mechanism for movement by rail or by rail and sea of the National Coal Board output that a prolonged spell of bad weather could still jeopardise some supplies. This applies particularly to the provision of domestic coal to areas where facilities for stocking do not yet exist. But when the row over alleged coal wagon shortage blew up shortly before Christmas, there were seven weeks' stocks at power stations and in distribution areas. Dismay at the NCB's financial losses through lack of sales consequent on non-delivery of domestic coal and through the high cost of emergency stocking, therefore, seems to have been the chief reason prompting Lord Robens' letter to Dr. Beeching. The NCB chairman urged Dr. Beeching to take all steps possible to ensure speedy and uninterrupted rail movements of coal. The BRB admitted that the number of wagons available for coal traffic was slightly smaller than in previous years, but other factors had been at work. The main cause of the blockage—which was never serious—was undoubtedly the increased production by miners before their Christmas break, which was at an unprecedented level in some areas. To this was coupled the reluctance of many domestic consumers to buy coal at reduced rates during the summer. The resultant situation was aggravated by bad weather and fog in mid-December, by some local shortages of BR operating staff and by heavy seasonal traffics of consumer goods and mails. Bad weather impeded, for instance, the return of colliers to Newport and Barry, thus disturbing the adjustment of rail despatches down the Valleys with shipments and with return of empty wagons, a procedure which normally works perfectly in all but the worst weather, after years of close liaison between the railway and other agencies concerned. As the BRB pointed out, the blockage was a financial inconvenience to the coal trade rather than a crisis in moving a vital commodity. By December 21, Lord Robens told Mr. Fred Lee, Minister of Power, the congestion had been eliminated, at least temporarily. Coal distribution will be proof against severe weather only after completion of the coal railheads on the pattern of West Drayton, which allow of adequate stocking of reserves.

Another BR oil contract

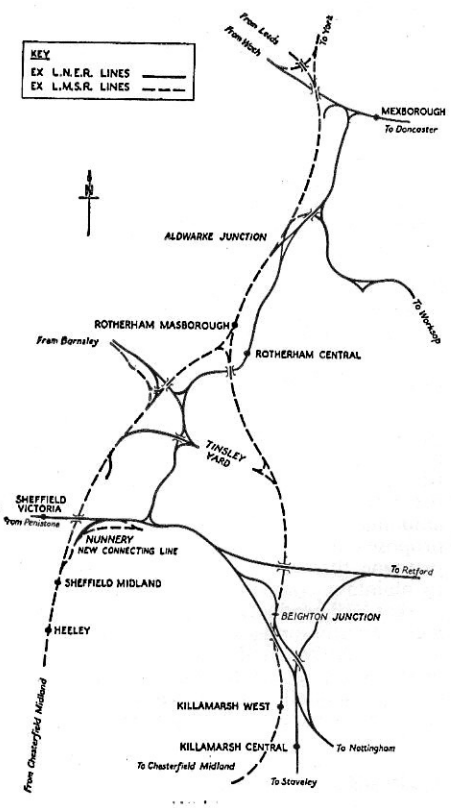
A further long-term contract for the bulk transport of oil by rail has been signed by Isherwoods Petrol Co. Ltd. and BR. Isherwoods, a long-established member of the UK oil industry, will offer substantial amounts of traffic over a term of years and propose to use rail to the maximum in planning their distribution in Britain, so as to maintain competitive prices. Isherwoods market VIP products throughout the country and presently supply over 300 garage outlets; its automotive and industrial petroleum products are imported. The group has grown very substantially over the past decade, but has been a part of the industry for nearly 40 years.

1,880 32-ton hoppers for BR

Discussing railway freight services of the future with the Metropolitan section of the Institute of Transport in December, Mr. F. C. Margetts, Member of the BRB, disclosed that 1,880 of the new 32-ton bottom-door discharge hopper wagons for merry-go-round coal operations were now on order. A proportion of them is being built by private industry. He also revealed that, in addition to merry-go-round workings proposed between pits and power stations which have already been published, tripartite study groups of the NCB, the Docks Board and the BR Regions concerned have prepared plans for continuously-operated shipment coal trains to Immingham and Swansea. Elsewhere in his paper, Mr. Margetts noted that BR were now running 600 customer trains a week, some daily, some thrice-weekly and some as required; these trains, which did not include any regular coal workings, were run on behalf of about 50 different organisations.

Fawley–Bromford Bridge oil traffic

Best-known, perhaps, of the customer trains already operated by BR are the Esso oil workings from Fawley, SR, to Bromford Bridge, in the West Midlands. Six trains are now run weekly via Didcot, Leamington Spa, Bordesley Junction and Saltley. Departure from Fawley is at 22.55 and the throughout journey to Bromford Bridge takes about 6hr, with a crew change at Didcot. The regular train formation is of 54 brake-fitted modern tank wagons, each weighing 34½ tons loaded, so that the full weight of each train is over 1,800 tons. The motive power throughout is provided by a pair of SR Birmingham RCW Type 3 diesels working in multiple. The braking of these exceptionally heavy trains, which for tonnage are unique on BR, has created some problems, writes a correspondent. There have been numerous instances of coupling breakages, involving both the screw and the Instanter type, through drivers attempting to restart their trains before the vacuum brake release has reached the far end of the formation. Despite the facility on each tank wagon which allows of braking adjustment to suit an empty or loaded state



The principal railways in the Sheffield area, showing the new connecting line that is to be built to allow concentration of all Sheffield's passenger traffic on the city's Midland Station.

of the tank, there have been strong complaints from SR guards of the return empty trains in particular that heavy shocks are sustained by their vehicles when brakes are applied on the run back to Fawley. This is understood to be the reason for the separation of each returning 54-tank empty train at Didcot into two loads for onward operation by SR crews. Bromford Bridge is also served by fuel oil trains from Avonmouth via Cheltenham, Kings Norton, Camp Hill and Saltley. Two paths are available for these trains, at 8.40 and 22.40 from Avonmouth, giving Bromford Bridge arrivals at approximately 13.25 and 4.00. The gross load on each working is usually in the region of 900 tons and the trains are scheduled for Class 9F 2-10-0 haulage, although occasionally Class 5 4-6-0s and Class 8F 2-8-0s are employed.

The WR's new Irish services

At the end of December the WR released details of its new facilities for motorists travelling to Southern Ireland via Fishguard this summer, which Mr. G. F. Fiennes, the Region's General Manager, disclosed in his interview with the Editor last month. Improvements include a new car-carrying train (the "London–Irish Car Carrier"), new drive-on-and-drive-off facilities at the Irish harbour of Rosslare to match those at Fishguard and more ferry sailings between the two ports. The car-carrier will run between Kensington Olympia and Fishguard Harbour. During the early part of the season it will operate each way at weekends—outwards on Friday night and back Saturday—and then daily (except Saturday nights) from July 11 until September 25. On its outward run the "Carrier" will leave London at 23.55 and cars and passengers will be in Ireland by 10.15 next morning. The return train will link with the mid-day ferry from Rosslare and be back in London by 21.55. There will be space on each run for 28 cars. Each car-party of four will have exclusive use of a reserved compartment in which rugs and pillows will be provided. As we have already reported, both sea terminals will have drive-on-and-drive-off facilities in full operation and the rail bridge at Rosslare, over which cars are at present carried on wagons between the mainland and harbour, is being converted to a road. Speedier handling of cars in consequence will enable the 4,000-ton ferry, the *St. David*, which at the beginning of 1964 was converted to drive-on-and-off operations, to fit two sailings in each direction into the 24-hr cycle. At the peak of the season there will be 19 sailings in each direction every week, and for the first time there will be regular Sunday crossings. A boat express will make the journey between Paddington and Fishguard in less than 5hr, the fastest time yet for this route, with one stop at Cardiff; it will leave Paddington at 8.50 and return from Fishguard at 15.45. Another boat train will leave Paddington at 8.00, calling at principal stations en route to provide connections to Fishguard from the Midlands, South Wales, and the West Country. Finally, a sleeper service will leave Paddington each weeknight at 23.35 to connect with the 7.00hr steamer. The return train, which will connect with the 22.45hr sailing from Rosslare, will run from Fishguard to Paddington on Tuesdays to Sundays

Sheffield Victoria to be closed

The ER has lately confirmed its intention ultimately to close Sheffield Victoria station, as forecast in MODERN RAILWAYS. To allow the concentration of all passenger traffic on Sheffield Midland, a new connection will be laid east of Sheffield Victoria, where the Nunnery branch line runs parallel with the ex-GC lines. The ER expects to carry out this work, which will give traffic from Kings Cross, Retford, Lincoln and Cleethorpes direct access to Sheffield Midland, next September. Thereafter, the only trains which will continue to use Sheffield Victoria will be those to and from Manchester Piccadilly, at present running with electric traction via Penistone, and the remaining services on the GC line. It was disclosed in last September's MODERN RAILWAYS, however, that the re-routing of the Sheffield–Manchester traffic via the ex-Midland Hope Valley line with diesel traction is under consideration. Large-scale improvements are forecast for Sheffield Midland station. They will include a new mechanised ticket office, seat reservation and road-rail enquiry office and modernised waiting and refreshment rooms.

More Ministerial reprieves

Two more BR proposals for service withdrawals were rejected by the Minister of Transport at the end of December. He has reprieved the service between Glasgow and Edinburgh via Shotts, on the grounds that the commuter traffic is substantial and that the alternative roads are already congested; moreover, Mr. Fraser has kept in mind the new town proposed at Livingston and other projected development in Central Scotland. The other closure refused is that of the Darlington–Richmond line; here the Minister has accepted the local TUCC's finding of hardship. The Minister has deferred for a year a decision on the closure of Felixstowe Beach and has also postponed judgment on three more Scottish stations—Midcalder, Slateford and Merchiston, but he has consented to the closure of Glasgow Eglinton Street. Four applications to close services were given his approval. They cover: 13 intermediate stations between Shrewsbury and Aberystwyth (which means that the revised timetable with diesel multiple-units can now be introduced), but not Caersws; 10 stations between Stourbridge, Worcester and Hereford; and the Halwill–Torrington service. The Minister has also approved closure of the Sunderland–South Shields line between East Boldon and Tyne Dock, with the proviso that a peak-hour bus service must be put on throughout the length of the line. This batch of decisions brings to 127 the Ministerial consents that have been given to

A pair of SR Birmingham RCW Type 3 diesel-electrics pass Worting Junction, Basingstoke, with empty oil tanks returning from Bromford Bridge to Fawley in July, 1964. As explained on this page, these 54-wagon trains are now divided when they reach SR territory. *Photo by G. D. King*

BR closure proposals. The Minister of Transport still has on his desk 36 which have been through all the statutory machinery and to these approximately 20 have been added since the present Government took office.

Withdrawals of service

The Scottish Region withdrew local passenger train services between Glasgow Central and Carlisle via Beattock and closed nine intermediate stations, including Law Junction and Symington, on January 4. On the same date the WR closed seven intermediate stations and halts between Bath and Swindon and 11 between Bristol, Gloucester and Worcester. From January 18, the LMR scheduled withdrawal of passenger services between Ruabon and Barmouth, including the Bala-Bala Junction branch, and between Whitchurch (Salop) and Welshpool, including the Llanymynech–Llanfyllin branch. This economy involved the closure of 41 stations and halts. However, as reported on page 78, these Welsh services were abruptly terminated by the disastrous floods that followed torrential rain on the night of December 12 and 13 and were not resumed. In the NER, the closure of the passenger services from Malton and Scarborough to Whitby, scheduled for March 8, is still being bitterly contested and an all-party action meeting was held in the town in December to discuss what further moves might be made. It will be recalled that Whitby was one town to which Mr. Harold Wilson gave a specific pledge in writing before the Election that, if a Labour Government was returned, its threatened rail closures would be rescinded. The Conservative MP for Scarborough and Whitby has taxed the Prime Minister with this pledge in the Commons, but so far he has secured no more than a reiteration of the finding that under the 1962 Transport Act the Minister of Transport has no power to revoke a withdrawal consent already made, in this case by his predecessor, Mr. Marples. On December 29, incidentally, a bus crew stranded in a blizzard were rescued by a Scarborough–Whitby train. Elsewhere in the NER, a branch was recently restored to use. This is the long-closed line from Dewsbury East Junction, on the former LYR main line near Thornhill, and Dewsbury Central Junction, on the former GNR Wakefield–Dewsbury–Batley line. It has been reinstated to provide direct access to Dewsbury Railway Street goods yard from Healey Mills yard. Hitherto this traffic has been taken from Healey Mills to Wakefield, where reversal was necessary, then to Wrenthorpe yard and on via Ossett to Dewsbury. It is believed in East Anglia that the ER is about to propose withdrawal of the East Dereham–Kings Lynn passenger service and further economies on the East Suffolk line. The SR seeks to close Bournemouth West station at the conclusion of the current timetable. The LMR is not to pursue its proposal to withdraw the Liverpool–Southport passenger service.

Reading–Tonbridge diesel service

Dieselisation of the Reading–Guildford–Redhill–Tonbridge passenger service from January 4, briefly reported last month, has been achieved by re-allocation and modification of Hastings six-car diesel-electric multiple-units. Each set has been broken up to yield its two power cars and two trailer seconds. From these four vehicles two three-car units have been fashioned by adding a 2-EPB electric multiple-unit driving trailer to a diesel-electric power car and trailer second. It is understood that five of these hybrid three-car units, which have been renumbered in the 1200 series, suffice to work the revised timetable, providing a basic hourly interval service throughout the day. All 140 seats in each unit are second class. First-class fares are no longer charged on the line except on electric trains serving Reigate and on those running between Guildford and Aldershot. However, anyone requiring a first-class season ticket from Godstone to London via Redhill, for example, can get a rate incorporating second-class travel between Godstone and Redhill and first-class between Redhill and London. Between Guildford and Reading an experimental bargain cheap day 5s fare (restricted in use until 10.24 or later) has been put on for six months; the ordinary return fare is 13s. Some services will be covered by diesel locomotive-hauled three-car trains including first-class accommodation, but this is open to all passengers at second-class rates. The new timetable includes some accelerations overall and some stations have later evening trains than before. The SR has launched a publicity campaign to attract fresh traffic to the service and new posters displayed at its stations urge that "the decision to retain—and modernise—this through cross-country link can only be justified if more people use it". New diagrammatic maps displayed in the coaching stock stress the useful main-line connections which the route makes between Reading and Tonbridge. Pointing out that the Re-shaping Report threatened the future of this passenger service, the SR says that it is examining other ways of reducing costs of operation and in particular that it is considering the possibility of ticket-issuing on trains. But, it says, the future of the service really depends on getting more passengers to use it. "We hope that the people who have asked for the service to continue will now take positive action and use it, particularly in off-peak hours."

Resignalling at Port Talbot

Colour-light signalling was brought into use between Neath East and Court Sart Junction on December 13. This completes stage 1 of the Port Talbot multiple-aspect signalling extension scheme, under which the section from Neath East to Llantrisant West will be controlled from Port Talbot panel box by September 12 this year. Provisional dates for other stages are:—

Stage 2. Court Sart Junction–Baglan–Dynevor Junction: March 28.
Stage 3. Tremains East–Llantrisant West: June 27.
Stage 4. Llantrisant West–Pyle West: September 12.

Cardiff–South Coast d.m.us this summer?

It is believed that the through services between Cardiff and Portsmouth via Bristol and Salisbury will be switched to diesel multiple-unit operation this summer. One gain from this move would be the possibility of diverting the trains to serve Bristol Temple Meads without operational complications at that station; at present they make their Bristol call at Stapleton Road to avoid reversal in the city. It is thought that this development may be the reason for the controversial allocation to the ex-SR lines west of Exeter of suburban-type diesel multiple-units with inadequate lavatory facilities, which were made spare by re-diagramming in the London and Cardiff areas. The Cardiff–Portsmouth service would obviously take priority for any "Inter-City" or "Cross-Country" diesel multiple-units which the WR can spare from other workings.

Computer control on the WR

The installation at Reading in September this year of three Honeywell H.200 computers, as reported last month, will refine the Continuous Progress Control (CPC) system which was established for the Cardiff District in September, 1962. This pioneer installation, employing a specially modified English Electric computer housed in the Cardiff Division headquarters, was described on page 78 of our August 1963 issue and on pages 111–115 of the February 1964 issue. Although the wagon control activity of the new computer system is initially to be confined to the Cardiff Division, the intention is to extend it to the whole of the WR; moreover, its successful operation may set a pattern for a future all-line freight and passenger rolling stock control apparatus. Of the three computers in the new Honeywell system, two will be continuously employed on wagon control work. At first there will be two control centres at Cardiff and Swansea, each of which will have several receive and send teleprinters by means of which they can interrogate the Reading computer. The latter will maintain a continuous record of the number of wagons by type and their individual state—for example, whether inwards or outwards loaded, empty or unserviceable—at approximately 300 locations in the Division, from sidings and goods yards to docks and collieries, and also of all wagons in transit, with details of their load. Thus controllers arranging wagon dispositions to meet local requirements can get answers from the computer which take account of any vehicles of the requisite type that may already be in transit to the requisitioning location. The computer will be fed with information to maintain its records through the control centres at Cardiff and Swansea. Periodically, statistics will be transferred from the magnetic drum of the computer, which keeps the

NEWS IN BRIEF

The price of platform tickets throughout BR was raised to 3d on January 1, except temporarily at stations where time was needed to adjust ticket machines.

The Greater London Council is advertising for a Chief Adviser on Transport Policy at a salary of approximately £6,000 a year; his job will be to co-ordinate a policy for public and private transport, to devise ways of improving public transport to offset increasing restrictions on the use of cars in central London, and to frame new public transport plans in relation to changing trends of travel.

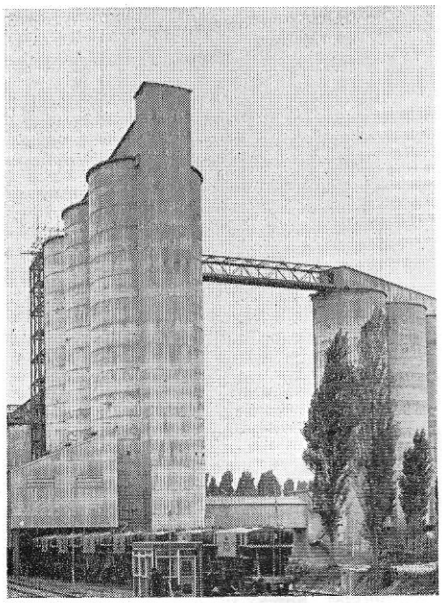
This Winter BR have 4,115 point heaters in use, compared with 2,180 in the 1963–4 winter.

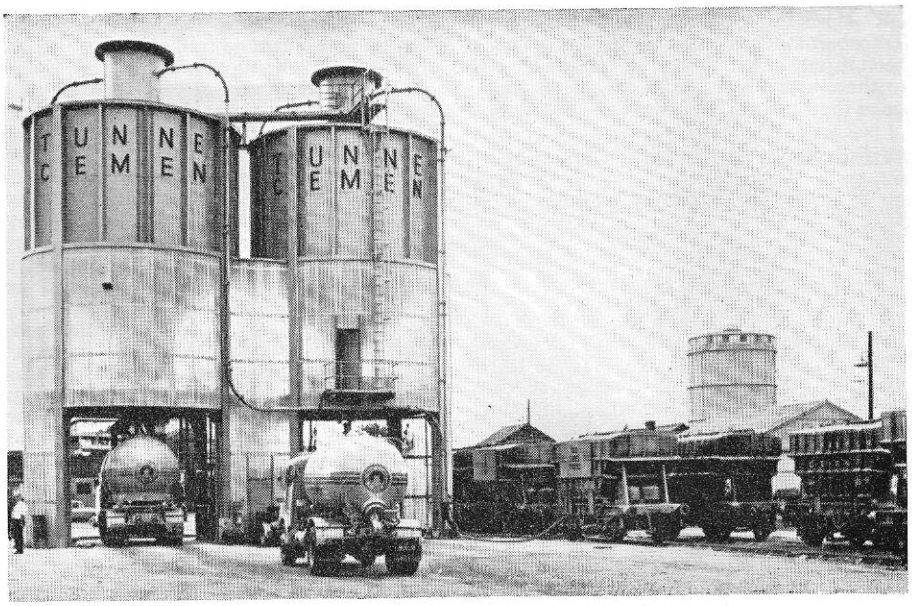
A former BOAC man is now promoting BR in North America; he is Mr. A. C. Buchanan, who was the airline's Area Sales Manager in New York until his recent appointment as General Traffic Manager of British Railways International Inc, the BR commercial sales organisation in North America, which has offices in New York, Los Angeles, Toronto and Vancouver.

To match its recently-announced cheap day fares between Inverness and stations in the Far North the Scottish Region has introduced a number of additional intermediate stops in the schedules of the 6.10, 10.30 and 17.00 from Inverness and the 6.00 from Wick to Inverness; day passengers from stations in the south can now have 7hr in Wick or Thurso and day passengers from the north a similar period in Inverness.

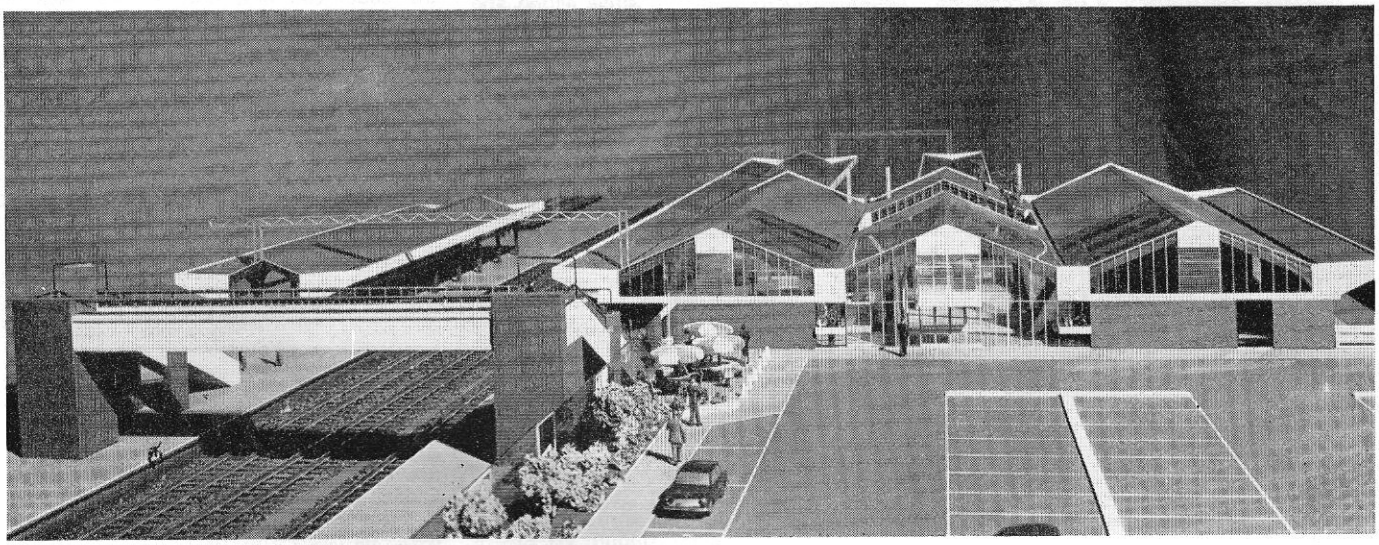
The ER withdrew the Tilbury-Gravesend vehicle ferry service from January 1, as most of its traffic now uses the Purfleet–Dartford tunnel, but the passenger ferry continues in use; the latter's working has been altered to continue the late evening passenger facility previously afforded by the vehicle ferry.

Mr. A. G. Parker, Management Staff Officer of the WR, has been appointed the Region's Assistant General Manager (Staff).

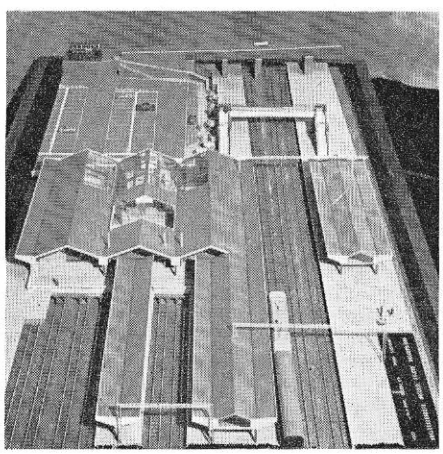


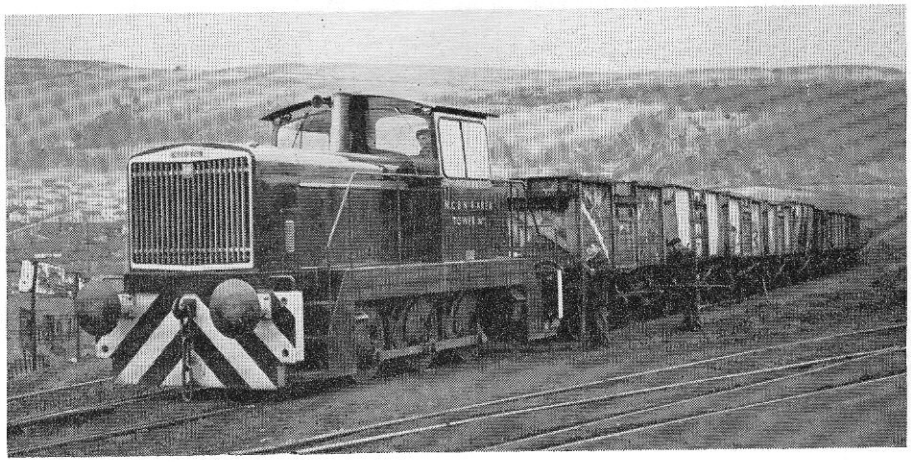


Cement for construction of the M4 motorway is travelling in 500-ton block trains of Presflo wagons between the Pitstone (Bucks) works of the Tunnel Portland Cement Co. and the firm's bulk storage and distribution railhead at Kew Bridge North depot, on the ex-NLR Richmond line. The LMR provided the site at Kew Bridge North, where two 230-ton capacity silos were erected. The 50 Presflos in the circuit are marshalled into two 25-vehicle trains, one of which is loading at Pitstone while the other is discharging at Kew Bridge; each train makes a complete circuit every 24hr. The illustrations show **(left)** Presflos loading at Pitstone and **(right)** the road distribution centre at Kew Bridge North. *Photos by British Railways*



Above and below left: Two views of a model of Northampton Castle Station as it will appear after rebuilding in connection with the LMR's a.c. electrification. Parts of the station roof have been removed to show the interior design.
Below right: An English Electric 455 h.p. diesel-hydraulic locomotive in service with the NCB in South Wales. A £230,000 order for 10 similar locomotives has recently been placed with English Electric by Stewarts & Lloyds Ltd. of Corby (*see page* 111).





continuous record of the wagon state, to magnetic tape. From this tape it will be possible to extract data on the demand for specific types of wagons and, for example, those which need frequent repair. There are possibilities that the computer may in due course be adapted for the control of motive power, train staff and other activities involved in train running.

English Electric UK orders

The 30 new 1,600/600 h.p. electro-diesels for the SR are being built by English Electric at Vulcan Foundry, unlike the first series, which were constructed in BR workshops. The first BR Type AL6 25kV a.c. locomotives of both the Vulcan Foundry and Doncaster works batches are complete; the Doncaster example has been painted in the new monastral blue shade. English Electric recently confirmed its receipt of an order from the Ulster Transport Authority, first disclosed on page 257 of the October 1964 MODERN RAILWAYS, for diesel-electric multiple-unit power equipments. Worth about £170,000, the order covers seven diesel-electric power cars and 13 trailers. Also included in the contract are seven underframes for the power coaches and eight pairs of bogies. The diesel engines and mechanical parts are being built at Vulcan Foundry, and the electrical equipment at Preston. The UTA is building the train-sets at its Belfast workshops. The new units will operate mainly on the Belfast–Coleraine–Londonderry service, a 90-mile run with five or six intermediate stops, on which they will haul a small number of parcels vans. Consideration is also being given to the use of two power cars to haul 450-ton freight trains at up to 35 m.p.h. Each power car will have one English Electric type 4SRKT four-cylinder supercharged diesel engine rated at 600 b.h.p. at 850 r.p.m.; this is the engine so successfully employed in the SR's diesel-electric multiple-units. A Napier type MS200 turbo-charger is used. The engine is directly coupled to an English Electric 392 kW main generator with a continuous rating of 900 amps. at 435V. A 21 kW auxiliary generator overhung from the main generator has a continuous rating of 233 amps. at 90V. The two nose-suspended traction motors, mounted on the inner bogie of each power car, are force-ventilated and continuously rated at 234 h.p. at 435 volts, 450 amps.; they are geared for a maximum speed of 80 m.p.h. English Electric have also received recent orders from Stewarts & Lloyds for 10 "Stephenson" 448 h.p., 54½-ton diesel-hydraulic industrial 0-6-0 locomotives. Worth some £230,000, the locomotives are for service on general duties at Stewarts & Lloyds' Corby Steelworks and are being built at Vulcan Foundry. Similar locomotives are in service with the NCB in Wales.

New divisional set-up in Scotland

A new Divisional organisation was introduced by the Scottish Region on January 1. Districts have been abolished, making the three Divisions, Glasgow, Edinburgh and Highland Lines (Inverness) the one intermediate tier of command, except in the sphere of sales promotion, between the Regional HQ and station or depot. There are three special features of the new Scottish organisation. First, the Highland Lines (*see the January issue, page* 49) is unique in that the officer in charge, Mr. Bernard Allison, is the only head of a Division to be responsible for *all* its activities; the other two Divisional Managers remain basically traffic officers responsible for commercial sales, finance, operating, and running and maintenance. Second, although each Division contains a very large number of stations and depots, stationmasters and goods agents now have enlarged responsibilities and powers of decision, so that only a few of the questions previously referred to District HQ need to go up to Division. Third, the commercial organisation has been strengthened. Each Division has a Commercial Manager and sales managers with appropriate seniority have been appointed in Glasgow, Edinburgh, Aberdeen and (covering also Perth) Dundee, and there is a new emphasis on sales efficiency and after-sales service. Salesmen are being supported by commercial teams at Divisional and Regional HQ. There are changes in Divisional boundaries. The Highland Lines have lost the ex-CR Oban line and the ex-NBR West Highland line to the Glasgow Division; and the ex-CR main line north of Dunblane to Perth and Aberdeen and the Perth–Dundee branch are transferred to the Edinburgh Division. Train control centres are ultimately to be reduced to three: Glasgow, Edinburgh and Inverness. Until then, controls are to be retained at Perth, Burntisland, Aberdeen and Kilmarnock—relics of the five pre-Grouping companies' organisations. Regional HQ is to confine itself increasingly to policy-making and planning. A Regional planning group is to be set up to oversee and co-ordinate the activities of committees and working parties for such projects as the Wemyss Bay electrification, Liner trains and coal and freight concentration. Mr. J. M. Fleming, formerly Divisional Manager, Edinburgh, has been appointed Regional Management Development Officer responsible for recruitment and training of senior staff needed under the new organisation.

Glasgow traffic control is being centralised

Traffic control of the Glasgow area is being concentrated in a single installation. The former Glasgow North control at Queen Street was recently amalgamated with Glasgow South Control, which is housed in premises at Hope Street, and eventually the latter will absorb the functions of Kilmarnock control. The Glasgow control, as the combined office is now known, will then be the only one in the west of Scotland. Concurrently with the reorganisation, there have been equipment improvements in the provision of selective telephone circuits, and also changes in practice with the elimination of the graph method of recording in favour of weekly train cards, which are considered to improve the oversight of freight working. All functions of the Glasgow Division's Movements Section, including freight rolling stock control, are to be incorporated in the Hope Street office.

Scottish ore traffic boom

The continuing boom in iron and steel production has brought good business to the Scottish Region. The 1964 carryings of some 2m tons of imported ore by block train from General Terminus Quay, Glasgow to the blast furnaces of Colvilles' Ravenscraig and Clyde Iron Works were a record for the Region. These operations were described in our June, 1963 issue. A minimum of eight booked trains are now operated daily on the circuit from ship to steel mill, but in the last few weeks of 1964 the soaring demand for raw materials needed as many as 14 trains in a day, and the week-end trip working had to be augmented. In 1962 the Scottish Region transported 915,146 tons of ore to the two works. A year later the railways carried 1,091,944 tons and in the first 11 months of 1964 1,894,569 tons were carried. With little sign of the demand declining the December carryings were expected to swell the total to well over 2m tons. At the quayside the ore is unloaded from the ship's bunkers by grab and taken by conveyor belt to overhead storage hoppers, where it is automatically weighed and discharged downwards into the wagons. The trains, each with a cargo of nearly 1,000 tons in 28 33-ton wagons, run from General Terminus to Ravenscraig via Carmyle and Langloan, returning by way of Uddingston and Newton. On arrival at the works the Type 1 diesel locomotive manoeuvres the wagons on to a grid, through which the ore falls onto a conveyor belt leading to the furnaces. The train then returns to General Terminus for another load. The entire process takes under 4hr to complete. If there is any further increase in demand for raw materials it is likely that round-the-clock working will be introduced this year. A spokesman for Colvilles said recently that "while there is bunker capacity at General Terminus Quay the system of delivery could not work satisfactorily by road. The service we are getting from BR is excellent, giving us both quantity and continuity in delivery".

Gourock electrification works begin

The first of the major works involved in the £6¼m scheme to electrify the lines between Glasgow Central, Gourock and Wemyss Bay have begun. The walls and floor of the 2,100yd-long Newton Street tunnel at Greenock—the longest in Scotland—are being undercut and given additional support and the tracks are being lowered by 13in to provide sufficient headroom for overhead electrical equipment in a section where it is crossed at an angle by another tunnel, the line to Princes Pier. Only a few feet separate the two tunnels. Where they cross, the crown of the Newton Street tunnel was thickened to bear the additional weight, thus reducing headroom in the tunnel. Before the tracks in the Newton Street tunnel are lowered the soft rock at the base of the tunnel walls will be cut away and replaced with concrete to give additional support. The job, which is being done at night, will take eight weeks. Newton Street tunnel was opened on June 1, 1889, when the Glasgow–Gourock line was extended by the Caledonian Railway, which had taken over the Glasgow, Paisley & Greenock Railway. Work will commence later in the spring on the demolition or raising of other bridges on the routes to be electrified. Increases in headroom will be required at 31 road overbridges and 27 footbridges.

Lomond steamer reprieved for 1965

Despite a 12 per cent reduction in the ship's 1964 traffic, from 133,095 passengers in 1963 to 116,588, BR have reprieved their Loch Lomond paddle steamer *Maid of the Loch* for a further season. But it has been reiterated that the ship's economic position is serious and that the 147-years-old service will end unless it receives better support. In a last attempt to attract more traffic—although the Scottish Region claims that it has made strenuous efforts already—new plans and publicity gimmicks have been announced. They include: free parking space in a larger car park for steamer passengers; a more vigorous poster campaign not only in the UK, but on the Continent and in America; a £100-plus-New York-and-Paris-holiday contest to find an attractive hostess for the boat; an extension of cheap fares, possibly to stations beyond Glasgow; encouragement of more charter work for the ship—for example, for wedding receptions and other social functions; the formation of a Maid of the Loch Children's Club with badges; and publicity for the ship in hotels.

Hourly at 85 m.p.h. over 343 miles

The initial service over Japanese National Railways' New Tokaido Line offers a standard average speed of 85 m.p.h. by the best trains. The timetable is regular-interval. Between Tokyo and Shin-Osaka (the new Osaka passenger station serving this line) there are 14 "Hikari" or "SPX" (super express) trains hourly each way daily from 06.00 to 20.00, leaving each terminal at the even hour (except at 12.00) and covering the 343.3 miles in 4hr including two stops. Westbound trains call at Nagoya (227.4 miles), 149min and at Kyoto (319.1 miles), 216min after leaving Tokyo; eastbound, the Kyoto and Nagoya stops are 22 and 88min from leaving Shin-Osaka. In addition, there is an almost-hourly service of "Kodama", or "LEX" (limited express) trains leaving each terminal at 30min past the hour and taking 5hr, stopping at the 10 intermediate stations. Both the "Hikari" and the "Kodama" trains consist of limited first- and second-class accommodation with buffet service. The JNR plans to reduce the Tokyo-Osaka journey time to 3hr this year. After mishaps in December, which delayed several "Hikaris", SPX supplements were refunded to passengers.

the Irish scene

Edited by L. Hyland

Dublin Kingsbridge station, on the departure side, showing the attractive platform tiling restored last year; it was photographed on June 4, 1964. *Photo by H. D. Bowtell*

CIE

THE reorganisation last September of Dublin-Sligo goods trains, mentioned in this column in December, has been causing some difficulties at Mullingar. The basic difficulty involved is the impossibility of shunting a lengthy goods train on the Sligo branch without fouling the Dublin–Galway main line. Accordingly, subtle alterations have been made to the running of the goods trains on the Midland section; they ensure that no two goods overlap at Mullingar, except at one period of the night from 00.41 to 02.00 when the Dublin–Sligo express goods crosses the up slow goods from Galway. This, it is hoped, will ease the congestion and at the same time make scheduled crossings between Clonsilla and Mullingar more reliable, for this lengthy single-track main line has a 9¼-mile section from Enfield to Hill of Down (most of the others are around 5 miles) which can cause considerable delays if trains are out of path. It is understood that CIE intend to run the Lough Derg pilgrimage traffic via Sligo in the coming summer, but whether this will be implemented if the Portadown–Londonderry line does not close remains to be seen. Since the closure of the Bundoran line in 1957 this traffic has been channelled to Omagh and thence by road. Although the road distance from Sligo to Lough Derg (Pettigo) is about double that from Omagh it is still 20 miles nearer than Portadown, the nearest point on the Dublin–Belfast main line.

The beet season just ended has been heaviest in the South Wexford area so far as rail loadings are concerned. The construction of a new long loading bank at Campile has greatly eased traffic there and this season is notable in the smooth working of specials to Thurles factory. The bottleneck at Waterford, so marked several years ago, has been eliminated.

Ireland's first single-line automatic barrier level crossing came into use on December 14, 1964 at m.p.56 on the Limerick–Athenry line near Craughwell. This is the fifth such crossing—the first four are on double track—and it precedes that at Shelton, near Arklow, which although installed and complete is not yet in operation as the factory is not in production and road traffic is, therefore, light.

The Dublin–Belfast "Enterprise" set has been modernised. On and from January 4 the formation includes up to four of the Cravens seconds—the first such on the Northern section—buffet car No. 2402 and new Inchicore-built first No. 1146. Motive power is still provided by a General Motors 950 h.p. locomotive. It was intended at the same time that the timings would be altered to departure from Dublin at 10.30 (instead of 11.00) and return at 17.10 (instead of 16.45). These alterations have not been made owing to the continuance of the Belfast–Portadown–Londonderry service; the revised timings can only be made possible by the alteration of local services contingent on the cessation of Londonderry trains.

Railcar No. 2509, formerly of the Sligo, Leitrim & Northern Counties Railway, which has been out of use at Limerick for almost a year, is currently engaged in training CIE crews on the Dundalk–Portadown–Belfast section. This is in preparation for the introduction of CIE goods services to Londonderry and Belfast on the closure of the Portadown–Londonderry line, which has now been given at least a temporary respite.

On January 4, notwithstanding the continuance of train services on the Portadown–Londonderry line for which it is a replacement, a new express coach service commenced running between Dublin and Londonderry and between Dublin and Letterkenny. The former is a joint CIE/UTA operation with two departures in each direction daily, including Sundays, while the latter is run by CIE alone on a similar frequency, except on Sundays, when there is only one coach each way. The 4hr 25min to each destination (including a 15-min refreshment stop at Monaghan) is rather better than present train timings via Portadown, but it remains to be seen whether it is not a little optimistic.

UTA

The most complicated "closure" in Ireland is the proposed cessation of all traffic on the Portadown–Londonderry line, the Coalisland branch, the Goraghwood–Newry–Warrenpoint branch and the closure of the stations at Goraghwood, Poyntzpass, Scarva and Tanderagee, all due on January 4. Following the UTA announcement of the closure (after permission was given by the Transport Tribunal in October) Tyrone County Council appealed to the High Court on the grounds that the Tribunal had misdirected itself in ruling that it could only grant or reject, but not defer the application. The case was heard before Mr. Justice McVeigh, who on December 11 ruled that the Tribunal had such power to defer the closure. Tyrone County Council claimed that for 6½ days the original hearing had "proceeded on the assumption that there was such jurisdiction"; only on winding up was it stated by the Chairman of the Tribunal that they had no such power. The application was referred back to the Transport Tribunal, but meantime the UTA, realising the impossibility of terminating services at such short notice, even if the Tribunal granted permission to do so, withdrew notice already given to 200 of its employees and announced that the Portadown–Londonderry line and the Coalisland branch would continue in operation pending determination of the matter. It was stated, however, that the Warrenpoint line and the four stations south of Portadown would be closed. This announcement provoked the Newry and Warrenpoint Urban Councils and the Newry Port & Harbour Trust to threaten a similar action to that brought by Tyrone. At the eleventh hour these interests agreed that the UTA might close the Goraghwood–Newry–Warrenpoint line—the station closures were unopposed—on the undertaking by the Authority that nothing would be done to render it incapable of reopening if the Transport Tribunal so determined. At its December 30 sitting the Transport Tribunal was to re-hear the Londonderry line case on January 15.

new books

Books reviewed in this feature and published in the United Kingdom are available from Ian Allan Ltd., Mail Order Department, Terminal House, Shepperton, Middlesex at the price shown, plus return postage.

WORLD'S UNDERGROUND RAILWAYS. By F. Henry Howson. *Ian Allan.* **25s.**

RAILWAYS UNDER THE GROUND. By John R. Day. *Arthur Barker.* **15s.**

The underground railway movement originated from city street congestion in the days of horse traction. When it became possible to use clean electric traction instead of steam at the end of the 19th century there was a sharp upsurge of interest in it in many countries; in many large cities the local authorities attracted promoters by paying the costs of the civil engineering. In London promoters had to fend for themselves and turned to the deep level underground because of the ease with which tunnelling could be conducted in the London clay. Suffering from the competition of the electric tram and later the motor bus, it has proved difficult for underground railways to make a living unless protected or subsidised. Nevertheless, the success of the motor vehicle and the proliferation of the private car have forced a new look at underground schemes and there are now the best part of 100 in being or in embryo throughout the world. Of these over 40 are in active construction and it is not surprising that this spate of activity has attracted the attention of writers. These two informative handbooks have appeared almost simultaneously.

Over a number of years Mr. Howson, who already has a popular book on the London system to his credit, has been gathering information on the underground railways of the world and in this latest volume he sets it out in a somewhat condensed form—too condensed for him to bring the name of the Glasgow Subway up to date as "Underground", or to refer to the three-car train experiments or the immediately postwar proposals for expansion. In reality the 128 pages are closely packed with information, but it is sometimes an effort to extract it, although this is obviously destined to be a much consulted handbook of data. For most of the 43 undertakings dealt with there is adequate descriptive material, with an account of the development of the scheme, a set of technical particulars, a route diagram and an illustration of rolling stock. It is difficult to discern a consistent pattern in the treatment, but perhaps this is inevitable; and some of the diagrams are reproduced on too small a scale for their lettering. What is obviously a Chicago train on the Englewood line is shown as New York rolling stock, but the principal active undertakings of the world are all covered.

A concisely written book on underground railway practice has been produced by John Day; he deals with the systems in over 30 cities throughout the world, with photographs and diagrams. Provided with factual information and some illustrations, the reader is told how pneumatic-tyred trains work in Paris or how tunnels are constructed in London, Paris, Lisbon and Milan. The Stockholm protected conductor rail is clearly described. By showing on a diagram all the Chicago rapid transit system, whether it is underground or not, the reader is given a better grasp of the city's facilities than Mr. Howson achieves. This book is part of an Age of Science series which refreshingly contains other railway material. **C.F.K.**

DIRECTORY OF RAILWAY OFFICIALS & YEAR BOOK. 1964–1965. *Tothill Press* **70s.**

Once again this invaluable and unique compilation has succeeded in maintaining a high standard of comprehensiveness and at least up-to-the-month accuracy—a remarkable achievement in view of political changes (such as those in Central Africa, of which the Directory takes due cognisance) and of the increasing tempo of railway modernisation in many countries. The only major country from which official revised information does not seem to have been received recently is China, but a good deal of useful information is in fact given on the Chinese Republic Railways. Two welcome additions are the lists of abbreviations of the names of railway administrations and of international organisations and agreements concerning inland transport—the former, we hope, a nucleus of additional entries embracing more administrations outside Europe. On the debit side, the list of the world's electrically-operated railways needs attention, notably in bringing up to date with the information available at the time of going to press; present omissions and some slight inaccuracies mar a feature unique, probably, in the world and in any language. **H.S.**

THE MIDLAND COMPOUNDS. By O. S. Nock. *David & Charles.* **42s.**

Except to Midland partisans, that railway's compound 4-4-0s were scarcely one of the country's most outstanding steam locomotive designs. To make them the subject of the first of a series of steam locomotive histories, as the publishers of this work have done, looked risky when one first saw it announced. Mr. Nock, however, has made an absorbing narrative of the type's history and performance, particularly in his account of the trials which produced the statistical support for standardisation of the compounds in the immediate post-grouping period. Here the book has the advantage of access to a great deal of hitherto unpublished documents, and from it Mr. Nock mines material for speculative discussion that will probably enliven a good many railway society evenings for the next few years. Might LMS motive power policy have taken a very different turn if the 1923 Leeds–Carlisle trial participant had not been a compound at the peak of ex-works condition, with a highly skilled fireman, and one of the 1924 contestants a run-down "Claughton" that was probably a gratefully released discard of Edge Hill shed?

Numerous mechanical drawings, dynamometer car records and indicator diagrams support the text, and there are performance logs in profusion in the concluding chapters dealing with the locomotives' latter-day work on the road. Of half-tone illustrations, for once in a way, there are too many. A reasonable proportion of the immense number are quite fresh, but one is baffled why the author or publisher crowded in so many that are not and which display neither outstanding photographic merit nor additional technical or operating feature. Why, for example, include two conventional three-quarter views of freights at Elstree on facing pages? The mystery is deepened by the enforced resort to tiny sizes for some of the host of pictures, despite the large page size. All this must have swollen production costs, needlessly inflating the cost of the book. **M.N.**

EARLY RAILWAYS. By J. B. Snell. *Weidenfeld & Nicholson.* **30s.**

This very graceful piece of book production—printed in Germany—was obviously devised to add a railway title to the publisher's series "Pleasures and Treasures" rather than to fill any known gap in railway literature. In the space at his disposal, Mr. Snell can do little more than provide a commentary to frame the illustrations, though his selective outline of world railway development up to the beginning of this century is pleasantly readable and quite unhackneyed. Outstanding are some excellent reproductions in colour of early railway paintings, many of them foreign and hence likely to be fresh to most purchasers, and of some modern photography of BR preserved locomotives and out-of-the-way overseas subjects. There are many gems, too, amongst the black-and-white reproductions of early engravings and prints. Refreshingly, for a British publication on railways, the accent is heavily on the Continental. **M.N.**

MAIN LINE ALBUM. Edited by P. B. Whitehouse. *Ian Allan.* **30s.**

With the quickening supersession of British steam, retrospective pictorials are evidently coming back into vogue. Apart from two introductory essays by Maurice Earley and Norman Harvey on the development of photography and locomotive work in the past 30 years before serious dieselisation respectively, this book, a companion to Whitehouse's earlier *Branch Line Album*, is exclusively devoted to photography. The period covers ranges from the late 1920 to very recent date. The standard of reproduction is high, but the choice of photograph and presentation leans heavily towards the conventional. Most of the pictures, almost all of them first-class work, are taken from the traditional three-quarter angle, which makes for tedium when one faces page after page of them, and the locations—even the photographs themselves in some cases—are largely familiar. To achieve the widest possible coverage in time and space, the editor has sought too much quantity for the room at his disposal. Many purchasers, one feels, would have preferred to pay more for a bigger book that would have given some of the illustrations the more ample display that they deserve; as it is, one or two attractive scenes do not make the impact they should because they have been reproduced too small and are overpowered by their less compelling neighbours. **M.N.**

Concluded on page 120

beyond the Channel

Edited by Paul Drew

FRANCE

Regenerative braking achievement

IN tests between Paris La-Villette and Château-Thierry on November 18, 1964, the SNCF Bo-Bo locomotive No. 20006 achieved the first recorded return of energy to the 25kV contact wire through silicon-controlled rectifiers. The s.c.r., or "thyristor" as it is now often called, has shown its ability to fulfil in traction service both functions of the mercury-arc rectifier with grid control—namely conversion from a.c. to d.c. and vice versa. When a rectifier locomotive is regenerating, its motors produce direct current which normally cannot flow back through the rectifiers to the supply. To take advantage of regeneration for braking, the power produced may be dissipated in resistances in the locomotive (rheostatic braking). In some circumstances, however, it is practicable and economic for regenerated power to be used by other trains and the SNCF has already equipped certain locomotives of the 16500 class with grid-controlled mercury-arc rectifiers which will work "in reverse" to feed current back to the supply. Similar use has been made of thyristors in medium-power industrial applications, but the regeneration achieved by No. 20006 on November 18 is believed to be the first by a thyristor equipment in railway traction. The tests were conducted on moderate gradients and No. 20006 exerted braking effort against a 16500 class locomotive propelling in the rear. In these conditions one of the problems of regeneration—how to be sure of absorbing the regenerated power and so maintaining braking—was avoided, since current was passing directly from the braking to the propelling locomotive.

No. 20006 is the original Alsthom rectifier locomotive of 1951 which made its début at the *journées d'information* at Annecy—in some respects the Rainhill trials of 50 c/s traction. It has been converted with thyristors and silicon diodes by the Société Jeumont-Schneider and is now rated for a traction output of 2,720 h.p. and a regenerative capacity of 1,000 kW. In the trials of November 18 braking efforts of between 7 and 9 tons were maintained continuously. Another effect of the modifications is that the locomotive can now operate on 1,500V. d.c. although at the reduced output of 680 h.p. This capability is required mainly for running to and from the main-line platforms at Aix-les-Bains when the locomotive returns to its normal duties on SE Region lines in the Savoy.

4,800 h.p. diesel-hydraulics in E. Region

The two SFAC prototype 82-ton, 4,800 h.p. diesel-hydraulic locomotives nos. BB69001-2 (*see the June issue, p.* 399) have, after extensive service trials, been allocated to the Eastern Region. They were recently about to take over regular passenger and freight duties between Paris, Belfort and Mulhouse (whence the line is electrified to Basle). Other diesels working on this main line include the 2,700 h.p. A1A-A1A68000 and 1,400 h.p. BB66000 diesel-electrics.

RATP flat "Travolator"

The RATP has installed a two-lane *trottoir roulant* (moving pavement) 433ft long in its own subway at Châtelet Metro station. With moving hand-grips, it resembles the "Travolator" at London's Bank station, which gives access to the SR Waterloo & City line, though it is quite level. The speed is 1.8 m.p.h. and maximum throughput 10,000 persons per hr each way.

Dijon-Bourg electrification

Traffic on the Paris–Marseilles main line now averages 120 trains each way per day over the double-track section between Dijon and Mâcon, where trains for Bourg, Geneva, Aix-les-Bains etc. and Italy via Modane diverge. Because of the risk of saturation of the section, the SNCF is considering dc electrification of the 87-mile direct line between Dijon and Bourg, which would enable Geneva trains to leave the Marseilles main line at Dijon. The 23-mile Mâcon–Bourg section was electrified in 1955, since when Geneva and Modane trains have run this way, to reduce the length of line requiring electrification. Since, however, signalling allows of headways of 5min or only a little more over the main line, it may be some time before traffic over the Dijon–Mâcon section reaches saturation point.

ITALY

Lightly-trafficked lines

Half the FS's 10,000 route-miles are carrying over 91 per cent of the traffic (about the same proportion as in 1938) and one-third (3,000 miles) convey over 75 per cent (71 per cent in 1938), whilst the least-trafficked 3,000 miles carry only 2 per cent of the total. Compared with 1938, total passenger traffic has increased by 245 per cent and freight by 134 per cent. The greatest traffic increases in the past quarter-century have been over the 45 miles between Milan and Piacenza, of 370 per cent in passenger and 230 per cent in freight. Whilst this section is a common route for trains between Milan (and north thereof) and the Ligurian coast, Tuscany, Central Italy, Rome, Bologna and the Adriatic by several trunk routes, it also carries a heavy Milan suburban traffic and serves industrial plants south-east of Milan. In general, traffic has grown and is growing on main lines north of the Apennines but not east of Bologna or along the Adriatic coast, and it has been decreasing in SE Italy. Whilst the volume of freight traffic has remained stationary between Rome and Naples via Formia (the *direttissima* line) and between Messina and Palermo, it is in general increasing between the North, Rome, Naples and Sicily. This is causing congestion in the neighbourhood of Naples (*see the December issue, p.* 360) and other large cities, and has created demands for re-signalling, additional trackage and other measures to increase capacity.

Until recently, any step such as the closures under the BR Re-shaping Plan or the SNCF *co-ordination* would have been out of the question for political reasons; but road haulage has made such progress that closure of some FS branches and smaller depots to freight traffic, at least in the north of Italy, would not cause great hardship. As to passenger traffic, such improvements in the standard of living of the mass of the people as have occurred recently, mainly in the north, tend to result in greater use of public transport. Despite the growth of bus and motorcar travel and of the phenomenal increase in use of the motor-scooter and motor-cycle, there will have to be a considerable rise in personal and family incomes in country districts before suspension of branch and stopping passenger services on any appreciable scale is practical politics. At present slightly less than half the total FS route-mileage is electrified, but this proportion will decrease as some lightly-trafficked sections, electrified some 30–50 years ago on three-phase, are dieselised on time-expiry of the equipment, rather than converted to d.c. working like the more important sections. As traffic on the main lines increases, however, the proportion of electric train-mileage is likely to grow.

Rack railway disaster

On December 3 last there was a serious accident on the 1 in 4 rack section of the Renon Railway from Bolzano to Collalbo in the Italian Tyrol. The train concerned was descending the gradient when the rack locomotive derailed, causing the crowded bogie motor coach behind it to leave the track and roll down the mountain side. Four people were killed and 56 injured. The accident will possibly lead to the immediate closure of at least the Strub rack section of this 7¼-mile, metre-gauge railway, for it was already planned to replace the rack by an aerial cableway in the near future. The railway will be retained for the 4¼ miles from the summit, 3000ft above Bolzano, to the terminus at Collalbo. The railway was opened in 1907, when the area was part of the old Austrian empire, and was electrified at 750V d.c. with an overhead wire from the start.

SWITZERLAND

Revised "Rheingold" working

The timings of the reorganised "Rheingold" schedules in Switzerland from May 30 are now known. Southbound, after a wait of 11min at Basle SBB, it will start at 15.52 and with stops at Berne (17.10/12) and Lausanne (18.18/20) will reach Geneva at 18.57—an acceleration of 30min to Berne and 47min to Geneva compared with the present connections, which involve a change at Basle. Northbound, the "Rheingold" will leave Geneva at 11.30, Lausanne at 12.09, and Berne at 13.17 (instead of the present 9.05, 10.12 and 12.30 respectively), reaching Basle at 14.35, 12min before the German departure, affording accelerations of 2hr 25min from Geneva, 1hr 57min from Lausanne and 47min from Berne. There will also be improved connections to and from the Bernese Oberland, via Berne, and Montreux via Lausanne. As reported last month, the through coaches between the Hook of Holland and Chur, and Dortmund and Milan, which are worked beyond Basle in ordinary expresses, will continue, according to preliminary information, to be available within Switzerland without supplements, although the "Rheingold" will rank as a TEE elsewhere.

Details of further Swiss changes are that the "Gottardo" TEE, which is to run through from and to Basle, will leave there at 7.32 and reach Zurich at 8.40, 10min before its southbound departure at 8.50, 5min later

than now; Lugano will be reached at 11.36, as at present, and Milan at 12.47, 2min later. Northbound departure from Milan also will be 5min later, at 17.10, but from Lugano at 18.12 as now; Zurich will be reached 7min later, however, at 21.11, and after a wait of 11min the run to Basle will be completed at 22.25. The times of 5¼hr in each direction between Basle and Milan will be more than ½hr faster than the best Basle–Milan time by the normal Lucerne route. The southbound "Gottardo" on reaching Milan will continue as at present, after a layover of just over 2hr, as the TEE "Cisalpin" from Milan to Paris.

Another important change will affect the "Transalpin" of the Austrian Federal Railways. This is to be composed of new stock, to leave Basle and Zurich 30min earlier, at 9.10 and 10.20 respectively, and to reach Vienna 60min earlier, at 20.40. In the westbound direction the Vienna departure will be at 9.00 instead of 11.40; Zurich will be reached at 19.36 instead of 22.47 and Basle at 20.45 instead of 0.13, an acceleration of 48min with more convenient arrival times.

New engineering works

The Bötzberg tunnel, between Stein-Sackingen and Brugg on the main line from Basle to Zurich, is being completely re-lined and to expedite the work over this busy route the double track has been temporarily singled between Effingen and Schinznach Dorf since October. It is essential to finish the work well before the completion of the flyover line at Brugg, which will divert the Basle–Gotthard freight traffic to this route. The Bötzberg tunnel is 2,687yd long. The new Biberlikopf tunnel, just west of Ziegelbrücke, on the realigned Zurich–Chur main line through the new Weesen station to the mouth of the Kerenzerberg tunnel, has been successfully pierced; but this will be only 142yd long. In Berne, plans have been finally approved for the new Hbf station buildings; the other work is in an advanced stage, with some of the new platforms in use, also the garage over them, and the new low-level station for the Zollikofen and Solothurn trains almost complete. On the Lötschberg main line the new bridge over the Kander, just south of Reichenbach, was completed in October, and from November 28 the double track has been in operation throughout from the mouth of the tunnel at Hondrich Süd to Frutigen.

More block trains

To simplify station working, minimise delays and facilitate seat reservation, the Federal Railways are to run more block trains between single destinations next summer. For example, there will be more complete trains between Basle–Chur and Basle–Buchs–Innsbruck (or Vienna), to reduce shunting in the awkward layout at Sargans; and a number of trains between or in transit through Switzerland and Adriatic resorts, Rome and the Italian Riviera will run to and from one Italian terminus.

AUSTRIA

New West to South electrified link

Completion of electrification of the 40-mile line over the Schober pass between Selzthal and St. Michael creates a second electrified link between Salzburg (and Germany and beyond) and Styria, Jugoslavia and SE Europe. Selzthal is on the Bischofshofen–Amstetten loop, which relieves the main Innsbruck – Bischofshofen – Salzburg – Linz – Amstetten–Vienna line. St. Michael is on the Vienna–Klagenfurt–Villach (Italy) main line, from which the main line to Graz and Jugoslavia diverges at Bruck a/d Mur, 17 miles north-east in the Vienna direction.

WESTERN GERMANY

Four 125 m.p.h. locos coming

Four, probably, of the 6,300-h.p. EO's class Co-Co electric locomotives now under construction are hoped to be in service this summer, in time to work the 125 m.p.h. trains between Augsburg and the Transport Exhibition in Munich (*see the January issue*). They are designed for the fast and heavy express services for which the DB has been preparing for some time, as recorded in previous issues. Twelve wheels, it is stated, are essential for the desired combination of power and speed. The total wheelbase will measure 44ft 8in and the length overall will be 64ft.

Slow progress with "Oeftering Plan"

As forecast in the December issue (p. 393) the Government is soft-pedalling the major economy issues raised by Dr. H. M. Oeftering, Chairman of the Federal Railway Directorate, in his proposals submitted in the autumn to the Minister of Transport, Dr. H. C. Seebohm, and also the proposals made in the report of the commission on municipal and other local transport. It has at last published the Oeftering proposals, which are in essence those stated in our article. As we went to press, the Government had not made any statement, but is to do so later; meanwhile, the Bundestag has been asked to defer debate until after the Government statement on transport. The Cabinet intends to deal simultaneously with both the Oeftering proposals, which are concerned largely with broad DB issues not affecting local passenger transport (and therefore capable of separate and early treatment save as regards the urban aspects), and the report on urban transport. This will certainly delay embarrassing discussion of the Oeftering proposals.

Whereas the latter call for a reduction in railway facilities generally, the report on urban transport advocates expenditure over the next 25–30 years of £750m on urban and suburban railways, out of a total of £22,000m on major works to improve traffic within and in and out of towns throughout the country; indeed the commission demands as a matter of national interest "a rebirth of the railway" as a means of moving urban and suburban traffic.

The Cabinet is reported to be concerned that the Oeftering proposals can realise economies to the extent of "only" some £45m annually (excluding, presumably, any relief of the DB of responsibility for pensions) and is no doubt alarmed by the contrast with the £80m DB deficit for 1964 and a probable £127m loss during the current year. It is also dismayed by public hostility to the withdrawals of freight and passenger rail facilities proposed by Dr. Oeftering. The relief of the DB of some of its pension and other financial obligations has now become a matter of urgency, which may well accord with the Railway Directorate's wishes. Whilst the Cabinet is feverishly seeking measures which it can advocate in its forthcoming statement as a solution, the Federal Railway is going ahead with the non-controversial rationalisation measures mentioned in the article quoted above, such as abandonment of redundant trackage. There seems to be no additional financial brake on expenditure on new motive power, rolling stock, signalling or other equipment deemed necessary for efficient working of the railways, partly no doubt in deference to the needs of Western German industry; and the progress of electrification work, which goes ahead smoothly from section to section, is geared to the resources of manpower and materials.

Free station parking pro rata

To attract motorists to rail travel, the DB has conducted an experiment in free parking at Regensburg Hbf. Passengers who book for a journey of 99–299km (61–186 miles) are given vouchers for free parking in the station car park for two days; those who book for 300–499km (186–310 miles) may park for three days; and free parking is accorded for four, five and six days for bookings of over 500km, 700km and 900km respectively. The experiment is reported to be successful, but extension to other stations is complicated by the absence of parking space likely to satisfy demands. Most DB passenger stations are in or near the centres of towns where land values are high.

Bigger role for Wuppertal Schwebebahn

The Wuppertal *Schwebebahn* ("suspended railway") runs over the River Wupper for the greater part of its length, thereby saving purchase of valuable land and affording a means of travel clear of the streets. Speeds are reasonably high (up to 25–30 m.p.h.). The disadvantage is the need to ascend stairs up to the station platforms. In view of increasing street congestion, the city council is encouraging the public to make more use of the *Schwebebahn*, which is operated by the Wuppertaler Stadtwerke AG, the city public utility undertaking. The line is to be re-signalled to increase train frequency by 50 per cent at peak periods and new rolling stock is to be acquired. Trains normally consist of two cars with a short intermediate vehicle.

PORTUGAL

Lisbon-Oporto electrification

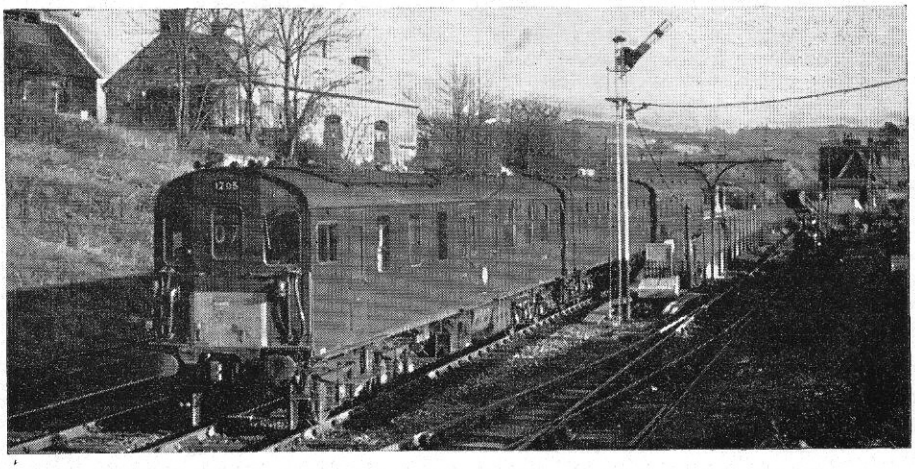
Another important stage in electrification of the Northern Line (Lisbon–Oporto), writes J. E. L. Skelton, was completed on November 23, when the first electric train reached Esmoriz, 195 miles from Lisbon, and only 12 miles from Vila Nova de Gaia on the south bank of the Douro, en route to Oporto. Long-distance locomotive-hauled trains now change engines at Esmoriz. In addition, some local passenger services operated by electric m.u. train-sets have been extended to Esmoriz from Coimbra B. Electric traction is due to reach Vila Nova by the end of next June, but the final short stretch over the river to Oporto itself will have to wait until the old single-line Maria Pia bridge, built by Eiffel in 1887, has been replaced by a double-line structure capable of bearing present-day traffic. Meanwhile, Campanhã, on the north bank, destined to be the principal station for the Oporto area, is to undergo radical alterations, which include platforms to take 16-coach trains; the existing locomotive depot and workshops at Campanhã are to be transferred to the neighbouring station of Contumil. Oporto's São Bento terminus also is to be closed to the public for six months, for major reconstruction involving platform widening and modernisation of passenger facilities. The floors to the tunnels between São Bento to Campanhã are to be lowered to accommodate a.c. overhead equipment. The main objective is eventual operation of outer-suburban electric services between São Bento and Aveiro (on the Lisbon line) and places on the principal Minho and Douro lines also due to be electrified.

CP modernisation

Recent orders by the CP include: 20 main-line electric locomotives; 21 three-car electric m.u. sets, locally built, and 15 diesel-electric locomotives of medium power, the latter financed in part by Eurofima. Passenger-carrying vehicles ordered include: three restaurant-buffet cars; 14 first-class coaches with nine air-conditioned compartments for the Lisbon–Oporto *rapidos* and international trains such as the "Sud Express" and "Lusitania Express", and 22 first-class coaches for general service. The CP is considering the inauguration of car-sleeper trains in internal and international services. Long stretches of the Northern and Beira Alta lines have been re-laid with 110-lb welded rails. On the latter section, the reinforcement of underline bridges and viaducts between Pampilhosa and Vilar Formoso, on the Spanish frontier, has made possible the running of main-line diesel locomotives and consequent acceleration of international trains such as the "Sud Express". Similar work has also been undertaken on the Eastern, or Beira Baixa line from Entroncamento to Guarda, serving Abrantes and Castelo Branco en route. Apart from the electrified lines, on which the installation of automatic and semi-automatic colour-light signalling is proceeding apace, other routes carrying heavy traffic are benefiting from improved signalling and telecommunication systems, also automatic half barriers at level-crossings.

traffic report

Edited by G. M. Kichenside



One of the Southern Region's hybrid 1200 class diesel-electric multiple-units, comprising two Hastings diesel-electric vehicles and a 2-EPB electric driving trailer, which are now working on the Reading–Redhill line. Unit No. 1205 was leaving Betchworth for a trial run on December 4, 1964. *Photo by W. G. Sumner*

London Midland

FULL electric working was introduced between Crewe and Rugby from January 4 and all passenger and freight trains with a few exceptions are now electrically-hauled north of Rugby. Passenger trains which remain diesel-hauled over the electrified lines are reported to be, in the down direction, the "Royal Scot" on weekdays, the 15.50 Euston–Stockport and the 17.40 SX, 18.30 SO Euston–Heysham; and in the up direction, the 6.55 Heysham–Euston, 9.30 Stockport–Euston, and the Sunday 11.25 and 17.10 Stoke–Euston.

Despite the release of additional diesel locomotives for use south of Rugby by the partial extension to Rugby of electric working at the end of November, the Christmas period and subsequent weeks saw the reappearance of steam power on a number of relief and ordinary passenger and freight turns at the London end of the Western Lines, with "Britannia" Pacifics and Standard and Stanier Class 5s most in evidence. The use of steam locomotives on a number of outer suburban workings from Euston at the beginning of January presumably heralded the annual difficulties with diesel locomotive train-heating boilers. From correspondents' reports and complaints publicised nationally in the press and on radio it seems that on the Midland Lines, BR/Sulzer Type 4s with failed train heating equipment are, nevertheless, being employed on passenger trains, which are therefore unheated.

Steam power has also returned temporarily to a number of workings both on the Western Lines electrified routes north of Crewe, where "Jubilee" and Class 5 4-6-0s have been noted on normally diesel-hauled parcels trains at Manchester Mayfield, and on the Midland Lines, where former LNER steam locomotives have been employed on a few occasions as diesel replacements. Class V2 2-6-2 No. 60837 (50A) powered the 16.48 Leicester Midland–St. Pancras semi-fast, on November 20, Class K1 2-6-0 No. 62060 (50A) headed the 20.15 Birmingham Lawley Street–Whitemoor freight on December 4 and V2 2-6-2 No. 60895 (50A) was employed on freight trips in the Leicester and Derby areas during the weekend of December 5/6. The most notable visitor to the Midland Lines, however, was Class A3 Pacific No. 60112, which brought up the 4.55 Derby–St. Pancras Goods freight on December 7; after arrival in London the engine was turned out later the same day by Cricklewood on GC line duty, as recorded later.

A correspondent clarifies the working of the Hendon–Gushetfaulds "Condor" services; both up and down trains now travel via Wigston and Nuneaton Trent Valley but are invariably hauled by a Cricklewood BR/Sulzer Type 4 which works throughout. The trains are not electrically hauled between Nuneaton and Crewe as suggested in the December issue.

The new passenger service between Birmingham New Street and Ely, which replaces the Rugby–Peterborough service, was introduced on January 4. With the closure of Nuneaton Abbey Street station the new service and the Leicester–Birmingham trains run via Nuneaton Trent Valley station, crossing the Euston–Crewe line on the flat junctions at each end of the station. Freight trains on the Midland route will continue to use the Midland tracks between Nuneaton Midland Junction and Abbey Street, which bridges the West Coast main line north of Trent Valley station.

Stratford EE Type 3 diesels now have other duties on the Western Lines besides the Tile Hill oil train; one at least has been employed fairly regularly on one of the Dagenham–Halewood car components or car-carrying trains as far as Rugby, where the train is taken over by an electric locomotive.

The two Derby-built single-unit diesel motor brake second cars Nos. M79990/1, formerly on the Bletchley–Buckingham service, and a normal Derby twin-unit motor brake second together with three driving trailers arrived at Watford during December to take over the St. Albans branch workings; the replacement cars are of the yellow diamond coupling pattern and will allow the four Park Royal two-car units allocated to Watford, which are of the standard blue square coupling code, to be transferred to an area where blue square cars are already in use, to give them improved availability. Despite an apparent shortage of diesel locomotives for Euston outer suburban duties over the Christmas period, an EE type 4 was turned out for the 8.40 Tring–Broad Street on December 22. In the reorganisation of LM Western Lines diesel power following the extension of electrification to Rugby, eight EE Type 4s, Nos. D299,301/2/4/5/6/9/12, have been allocated to Willesden for freight work.

Two of Toton's Brush Type 4 diesels, Nos. D1618/20, were working from Westhouses depot during December; they were being employed on the Willington and Staythorpe power station block coal trains. A new diesel servicing depot is under construction near the site of the present Heaton Mersey steam shed; it can accommodate four BR/Sulzer Type 2s simultaneously.

The past few weeks have seen a considerable variety of steam power on Great Central line services. As mentioned above the outstanding visitor was A3 Pacific No. 60112, which was employed on the 20.28 Marylebone–Preston parcels as far as Nottingham on December 7; it returned to London on the following day

with a morning Nottingham–Marylebone parcels and then headed north again with the same day's 20.28 parcels. After an absence of about two months, Class V2 2-6-2s returned to the GC in force and there were almost daily visits by members of this class. From December 14 the provision of motive power for all local workings in the Marylebone area was transferred from Cricklewood to Willesden and visiting locomotives will be serviced at Willesden. Although Willesden's Type 2 diesels have been employed on a number of former steam turns, Cricklewood's standard Class 4 2-6-0s, which were used on GC line duties, have been transferred to Willesden and continue to be used on the GC. Another train which is now regularly diesel-powered is the 21.55 (SX) Marylebone–Manchester as far as Nottingham. It is diagrammed for a BR/Sulzer Type 2, which returns on the 23.05 from Manchester. The equivalent Saturday working, the 22.45 from Marylebone, continues to be steam operated. Also from December 14, Aylesbury's station pilot became a diesel shunter duty. The locomotive spends a week at a time at Aylesbury and runs light to and from Bletchley at weekends. These arrangements have entailed alterations to other Marylebone–Nottingham diagrams; the 8.15 Nottingham–Marylebone is now double-headed from Rugby, usually by two Stanier Class 5s. Occasionally a shortage of 4-6-0 power has led to the use of smaller locomotives on the Nottingham semi-fasts; on November 17 an unidentified ex-LMS 2-6-4T took out the 14.38 from Marylebone and on November 30 Standard Class 4 2-6-0 No. 76041 was in charge.

Almost exactly a year after the spate of "Western" class failures in their last days on Paddington–Birmingham services came a number of failures with Brush Type 4 diesels on this service during the latter part of November and early December. During the last week of November a large proportion of Cardiff Canton and Landore Brush Type 4 units were employed as replacements on Paddington–Birmingham–Shrewsbury services. The nadir was reached on December 8 when the northbound "Pines Express", after a diesel failure at Leamington and the derailment of a locomotive sent for assistance, eventually arrived at Wellington 4½hr late. Within two hours of this the Brush Type 4 of the 18.10 Paddington–Birkenhead failed at Wellington and received assistance from a tender-first "Grange" 4-6-0 to Shrewsbury. Simultaneously, BR Standard Class 5 4-6-0 No. 73050 failed near Wellington with the 20.25 Abbey Foregate milk. The southbound "Pines Express" was also in trouble on December 10 and 17 when "Britannia" Pacifics Nos. 70048/7 respectively were noted with the train at Wellington, although our correspondent is uncertain whether they worked through to Oxford. Nevertheless, No. 70048 returned north on December 11 with the 13.14 Morris Cowley–Bathgate car-carrying train. A "Western" class diesel returned to the GW Birmingham line on December 18 with a relief train from Plymouth, which ran to Birmingham New Street.

On Sunday, January 3, the LMR started a programme of track welding between Preston and Carlisle. The main line between these points was closed to through traffic and trains were diverted over the Midland route via Blackburn, Hellifield and Ais Gill.

Among about 70 withdrawn steam locomotives which have been bought by John Cashmore Ltd. of Great Bridge, Tipton, for breaking up are 11 "Jubilee" 4-6-0s and ten "Coronation" Pacifics; by December 12, at least seven of the latter class—Nos. 46228/39/45/8/51/4/6—had arrived for cutting up. The last LNWR locomotives in BR service, the four 0-8-0s, Nos. 48895, 49361, 49407 and 49430, at Bescot were withdrawn in December (*see illustration on page* 118). Two, Nos. 49430 and 49361, were employed on a special excursion on December 12.

[For LMR information we are indebted to Messrs. T. S. Lord, A. G. Briggs, N. Liszewski, G. D. Greer, D. N. Chapman, "5076", D. Cox, D. R. Thornhill, H. Gillott, B. R. Tunnard, M. G. Sharp, G. P. Bannister, R. N. Morton, A. L. Hodgetts, N. H. Treadwell, B. G. Price, D. T. J. Rollason, "30900", S. Dodd, G. Oliver, East Warwickshire Locomotive Society, M. M. Wright, J. Harrison, C. Tatlow, N. L. Holbrook, M. J. Cowman, R. Pearch, T. H. Fisher and P. N. Brown.]

Eastern & North Eastern

November and December saw the appearance of a number of steam workings on relief passenger and parcels trains on the East Coast main line, even as far south as King's Cross on one or two occasions. On November 12 two steam workings into London were reported—Class B1 4-6-0 No. 61250 (40B) with an up parcels train and Class A3 Pacific No. 60112 (34E), which as reported in the LM notes, was active on the Midland and GC lines in December, with an up empty stock train. The most notable steam working, however, was that of Class O4 2-8-0 No. 63607 (36E) which on December 4 reached as far south as Hitchin with a coal train. On Christmas Eve Class B1 4-6-0s Nos. 61097 and 61272 powered two King's Cross–Grimsby trains, but even with 12 down reliefs noted in a 6hr period at Peterborough, remaining trains were entirely diesel-worked. A number of pre-Christmas reliefs were noted at York with steam power; four at least of the surviving A3 Pacifics—Nos. 60052, 60100/6/12—were active north of York. Class V2 2-6-2s powered a few GN/GE Joint line freights between Doncaster and March during December as diesel substitutes.

The removal of the surviving steam allocation at New England shed from January 4, will bring to an end the isolated visits by steam locomotives south of this point and may presage the end of all steam working south of Doncaster on the GN main line.

One of the trains affected by the Sandy derailment on the night of December 17/18 was the up "Night Scotsman". After a long stand at Tempsford the train was eventually taken back to Peterborough and reached King's Cross via Cambridge. Other trains were also diverted by this route.

The latest official lists show the withdrawal of the last A3 Pacifics allocated to the NER, leaving only six in capital stock: three—Nos. 60041/52 and 60100—at St. Margarets; and three—Nos. 60062, 60106/12—until recently at New England. Official withdrawals have also rendered extinct the last of the Gresley Class V3 2-6-2Ts. The original version, Class V1, with lower boiler pressure, became extinct some time ago.

Heaton's line of condemned Pacifics was despatched by December 12 to various scrap merchants. Draper's Yard at Sculcoates, Hull has taken delivery of a number of types including B16, "Jubilee", "Royal Scot" and "Castle" 4-6-0s, at least five Class A3 and four A1 Pacifics. Three of the A3s were towed to Hull by Class A4 Pacific No. 60024 on December 9. In East Anglia, recent arrivals at King's scrapyard at Norwich have included several of the pioneer Derby-built diesel multiple-unit cars in the 7900X and 7950X series.

A shortage of serviceable BR/Sulzer Type 4 diesels has led to motive power difficulties in both the Leeds and Newcastle areas. English Electric and Brush Type 4s are being employed as replacements as far as possible when a BR/Sulzer locomotive is not available, but in the Leeds area surviving steam locomotives are being utilised on a number of freight and parcels turns. Occasionally the barrel has to be scraped to find locomotives of any sort, which has led to the appearance of steam power on one or two passenger workings between Leeds, York and Newcastle.

The Bishopsgate fire reported in detail elsewhere in this issue led to some unusual multiple-unit formations on the emergency Fenchurch Street–Southend Victoria services, including on one occasion a train composed of LMR unit 022, Bishop's Stortford unit 510 and Southend Victoria unit 148, the first visit of an LMR unit to Fenchurch Street.

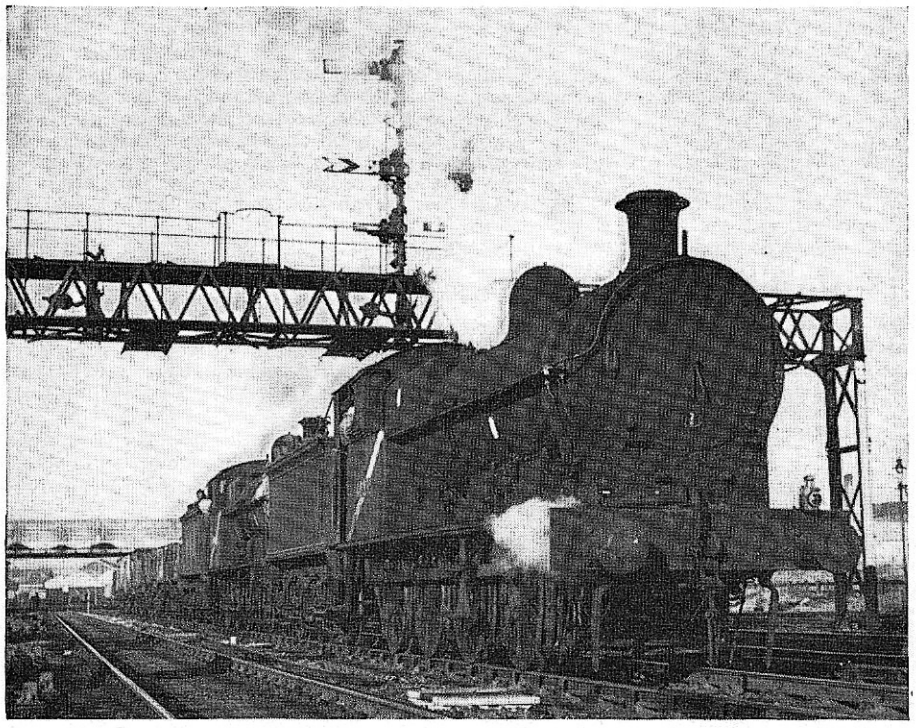
[For ER and NER information we are indebted to Messrs. D. Graves, G. Dearman, M. G. Arnold, R. J. I. Corden, J. L. Lycett, M. Burgess, D. Craft, D. B. Cawbwell, P. L. Roberts, J. Yeomans, N. M. Wilson, B. White, Ipswich Land Transport Society, J. G. Manley, B. Ringer, R. A. Holland, R. B. Barnsley, P. Frogg, J. Richardson, P. Vine, E. Webb, N. Caplan, J. Blythe, B. Hartley and B. Rodda.]

Western

Despite plans for the elimination of steam in South Wales by the end of last year, steam traction was still well in evidence on South Wales main-line freights during December and January, chiefly as a result of the appropriation of some of its diesel allocation to replace diesel failures elsewhere, particularly on the Paddington–Birmingham line, but also to cover the non-availability of diesel-hydraulic locomotives awaiting repair. A number of the South Wales Brush Type 4 freight diagrams have been covered by 56XX 0-6-2T, 42XX 2-8-0T, 72XX 2-8-2T and 38XX 2-8-0 types and there have been the usual visits on through freights by Stanier 2-8-0s and standard 2-10-0s. The most notable arrival, however, was "Castle" class 4-6-0 No. 7022, which was observed at Margam with a westbound freight on December 11; the engine later adjourned to Neath shed and returned east on December 13. Another unusual visitor to Cardiff was Fowler 4F 0-6-0 No. 44334 (15E), which arrived with the 12.00 from Cheltenham on December 5. The Briton Ferry–Birmingham steel billets trains which were dieselised at the beginning of December were among those which reverted to steam during the month; they were generally powered by Tyseley "Hall" 4-6-0s. South Wales English Electric Type 3s do not have many workings into England, but one is regularly employed on coal empties from West Drayton which it takes over at Swindon. Others of the type have made occasional trips to Westbury on freight duties.

Swindon shed closed completely during December and its surviving steam locomotives were transferred to Gloucester. An LM-based "Castle" class 4-6-0 still has a fairly regular working to the Swindon area with the Grimsby–Swindon fish trains. Nevertheless, the last WR-based "Castles" are reported to have been stored during December and the remaining LM-based members of the class were expected to be withdrawn very shortly. The latest official lists show the condemnation of the last 63XX 2-6-0s, which makes the Churchward 2-6-0 and its variants extinct. Among a batch of locomotives arriving at Llanelly on December 5 for breaking up were seven SR light Pacifics, Nos. 34020/30/65/78/80, 34106/7.

Troubles with diesel locomotives have not only upset diesel diagrams but have reacted on some of the tight turn-round times of coaching sets. On December 12, the failure of "Western" Type 4 No. D1006 on the 7.15 Bristol–Paddington near Taplow led to a 52min late arrival at Paddington. The 7.15 up then forms the 10.45 Paddington–Bristol, the 13.15 Bristol–Paddington and the 16.45 Paddington–Bristol. By the end of the third leg of the diagram the train was still 39min late. Four days later, No. D1033 on the Exeter University special from Exeter to Paddington came to grief between Heywood Road Junction and Lavington and the train eventually reached Paddington 3½hr late.



Due to be withdrawn at the end of 1964 were the four surviving LNWR 0-8-0s, which were retained at Bescot depot for the job on which two of them are seen here; Nos. 48895 and 49430 are pausing at Walsall to attach wagons to the 9.30 Water Orton–Wolverhampton and Willenhall Stafford Street freight on October 13, 1964. *Photo by R. Shenton*

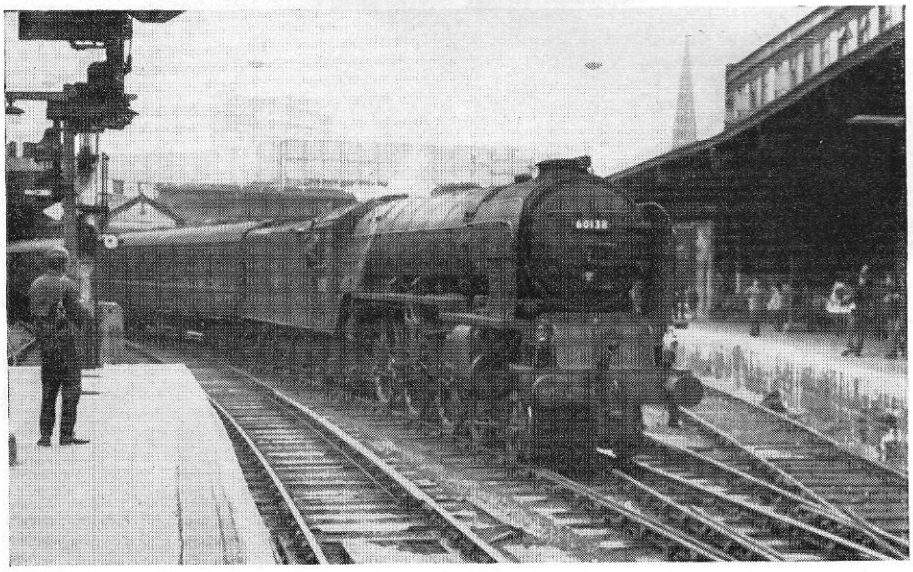
The locomotive itself is reported not to have failed through any defect but to have run out of fuel; a faulty fuel gauge was unnoticed when the locomotive was previously serviced. As a result, the following "Cornish Riviera Express" was diverted from Westbury via Chippenham.

New Brush Type 4 diagrams introduced in recent weeks have included the 17.12 Bristol–Severn Beach, and in the Westbury area a Bristol–Westbury early morning parcels train, the 7.14 Westbury (5.25 Swindon)—Salisbury and the 10.12 Salisbury–Bristol; the 8.20 Bristol–Salisbury and 12.16 return, the 12.35 Cardiff to Portsmouth as far as Salisbury and the 17.35 Salisbury–Cardiff. Occasionally, "Western" or "Warship" Type 4s have been employed on these turns, particularly the 12.16 from Salisbury.

Christmas extra parcels and passenger trains in the London area were largely in the hands of diesel traction, although one or two isolated steam workings were reported, among them the arrival at Paddington with a parcels train from Birmingham, of Stanier Class 5 4-6-0 No. 45303 (6A) on December 16. Other occasional steam workings survive on freight services to and from the London area, the engines of which are serviced at Southall. On December 11 in fact eight steam workings were noted in the West Drayton vicinity in the space of ½hr, mainly "Hall" 4-6-0s but also Stanier 2-8-0s and Standard 2-10-0s. A second Swindon-built Type 1 diesel-hydraulic 0-6-0, No. D9524, has arrived at Old Oak Common. The new three-track diesel maintenance depot here was nearing completion at the end of December and work had started on the demolition of the remaining turntables in the roundhouse. A correspondent amplifies the working of the 16.15 (SX) Paddington–Bicester–Banbury train referred to in the December issue. It was diagrammed for steam haulage and was exclusively steam-worked during October. On several occasions, however, special parties had been booked on the 16.20 Paddington–Oxford–Banbury service, which is diagrammed for a four-car diesel multiple-unit and, in the circumstances, the two trains exchanged rosters.

[For WR information we are indebted to Messrs. R. Watson, G. H. Davies, D. G. Fisher, M. Wood, N. A. Collins, J. H. Sparkes, C. M. Napper, R. Hummerston, P. N. Herbert, "Merlin", D. J. Newport, R. J. Thorne, A. J. Spencer, D. J. Mitchell, "4959", V. Bunting, R. Moorcraft, R. Davies, R. N. Pritchard and M. Parry.]

Class A1 4-6-2 No. 60130 *Kestrel* arrives at Birmingham New Street with the 9.20 Newcastle–Bristol express on October 24, 1964. *Photo by M. C. A. Covey-Crump*



Southern

A combination of additional Christmas parcels trains and a further crop of diesel troubles led to the appearance of steam power on one or two Oxted line passenger services and on some Central Division parcels and freight trains during December. The diesel difficulties now seem to be affecting the Oxted line multiple-units and some diagrams are being covered by Hastings or Hampshire multiple-units; others are being worked by BR/Sulzer Type 3 diesels and locomotive-hauled stock, but on December 30 the 7.17 East Grinstead–London Bridge reverted to steam power with Standard Class 4 2-6-4T No. 80068 in charge. On the previous day the 18.10 Victoria–Brighton via Oxted was cancelled and the two multiple-units normally forming the train worked the 20.09 from Victoria instead. One unit, however, was unable to provide any power and the second unit failed at Uckfield. The following 21.58 Oxted–Brighton was unable to give assistance to two failed units and Type 3 diesel No. D6568, which had been summoned from Lewes to give assistance, took the two multiple-unit sets forward, although it was unable to provide lighting or heating.

Steam was particularly prominent at Lewes in the two weeks before Christmas; a special Brighton–Eastbourne–Hastings parcels turn was normally powered by Redhill Class N 2-6-0s although on December 21 and 22 Class Q1 0-6-0 No. 33006 was used instead. A subsequent leg of the diagram included the Lewes–Crowborough freight, the first time for some years that this turn has been performed by a Q1. The morning Newhaven freight was another duty performed by Redhill N 2-6-0s; and on December 16, Standard Class 4 2-6-4T No. 80032 was at work on freight and parcels trains between Brighton and Lewes.

The new Brighton line 4-CIG express stock is still employed on crew training and test running; one unit, generally No. 7301, has a regular Monday-to-Friday trip between Selhurst and Ford, and, at the end of December, No. 7303 was noted on similar duties between Selhurst and Haywards Heath. Latest deliveries of these units to the SR have included units 7307–9. A correspondent comments on the origin of the CIG code for this stock, and confirms that our original report that it was based on the LBSC telegraphic code "IG" for Brighton was correct. From February 1 those electric multiple-units numbered in the 5000 and above series, but including the Portsmouth express sets fitted with roller blind headcode panels capable of displaying a red blind at the rear, need not carry oil tail lamps. The Ministry of Transport relaxation in this respect stipulates that electric tail lamps must comprise two independently-fed circuits; LT m.u. stock built since 1938 has been so

equipped but on BR only certain a.c. multiple-units have previously been exempt from carrying an oil tail lamp.

The variety of steam power on the Reading–Redhill–Tonbridge services continued until the end of steam working on January 3, although during the last week the majority of workings were in the hands of Southern 2-6-0s or standard classes. The replacement three-car diesel-electric multiple-units, formed of a Hastings-type motor brake second and trailer second coupled to a former 2-EPB electric driving trailer second, will be maintained at West St. Leonards diesel depot. The inclusion of the Restriction 4 9ft-wide driving trailer precludes empty running between Tonbridge and St. Leonards on the SEC Hastings line and the units will therefore work between Redhill and St. Leonards via Lewes. Unfortunately the new service did not get off to a very good start and at least four failures were reported in the first two days.

On the South Western Division a notable motive power combination was reported on December 28 when "West Country" Pacific No. 34038 piloting "Western" Type 4 diesel No. D1073 were noted at Feltham on empty parcels vans heading towards London, the first occasion, it is believed, that a "Western" class locomotive has been utilised on Exeter–London workings. A Hymek Type 3 now appears to have a regular diagram between Exeter and London on Sundays; it comes up on a morning milk train and returns on the December 26. Other unusual arrivals included "Castle" 4-6-0 No. 7026 with a football special from Hereford on December 16 and "Western" Type 4 diesels Nos. D1021 and D1053 respectively on December 11 and 28, deputising for diesel multiple-units from Bristol.

[For SR information we are indebted to Messrs. J. Evans, P. Treund, A. Wright, I. G. K. Richards, P. T. W. White, M. Haywood, D. Denton, P. Braithwaite, G. J. Murray, J. Critchley, L. A. Tubb, "30199", R. Godfrey, A. R. M. Williams, M. J. Hill, H. T. Hunt and R. G. Ensor.]

Scottish

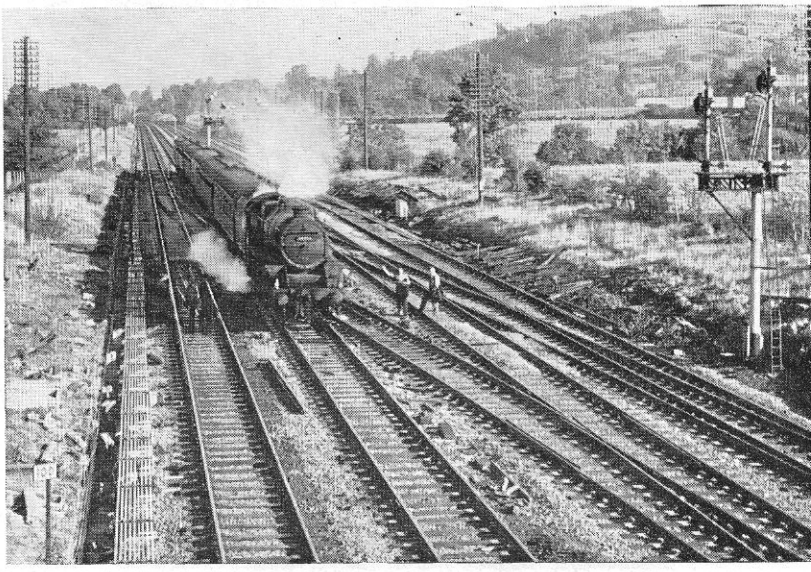
Crewe-based Brush Type 4 diesels now have regular diagrams which take them to Perth, and which include trips on the Glasgow–Aberdeen main line. One covers the Euston–Inverness "Royal Highlander" from Crewe to Perth; from here the locomotive works the 7.00 Perth–Glasgow semi-fast, the 10.00 Glasgow–Aberdeen as far as Perth and finally returns south with the 21.00 Perth to Euston sleeper as far as Crewe. Other Crewe Brush Type 4s have taken over from English Electric Type 4s on a number of occasions the diagram which includes the 22.15 Glasgow–Aberdeen and the 15.30 up West Coast Postal from Aberdeen. The cancellation of most of the Anglo-Scottish trains over the Christmas weekend led to the steam power for the steam heating of passenger stock. In previous years standard Class 4 2-6-0s and Class B1 4-6-0s have been employed on this job but, during recent weeks, Ferryhill has turned out standard Class 5 4-6-0 No. 73056 for this duty and, since two engines are required, has appropriated visiting locomotives, generally Stanier Class 5s. On December 9, however, Ferryhill had to resort to the utilisation of A4s for steam heating between trips.

An unusual visitor to Aberdeen on Christmas day was Class A1 Pacific No. 60154, which powered the 22.30 Craiginches–Millerhill freight—the first A1 to reach Aberdeen since July. Another interesting working on the same day was that of "Clan" Pacific No. 72006, which piloted A4 Pacific No. 60007 on the 13.30 Aberdeen–Glasgow train. The "Clan" had arrived earlier in the day and would normally have been employed on the 14.11 fish, which was cancelled on this date.

With the transfer of the former Edinburgh Princes Street–Stirling/Perth trains to Waverley station, former LMS steam classes—mainly Stanier Class 5 4-6-0s—now outnumber the few surviving ex-LNER steam locomotives still employed on occasional services from Waverley. Another Scottish-based Deltic diesel has been named, No. D9006 *The Fife and Forfar Yeomanry*, in a ceremony at Cupar station on December 5.

At least six withdrawn Stanier "Corona-

The new passenger service order on the Central Wales line—a three-coach diesel multiple-unit forming the 11.45 Shrewsbury–Llanelly enters Knighton on September 8, 1964.
Photo by E. J. S. Gadsden



The new connection between the former GWR and LMS lines at Standish Junction, recently laid in to allow trains to and from the Swindon direction direct access to Gloucester Eastgate, is seen in this view of Class 5 4-6-0 No. 44804 heading the 7.35 Nottingham–Bristol on October 24, 1964.
Photo by B. J. Ashworth

afternoon milk empties from Clapham Junction. Weymouth has again received a number of unusual visitors on parcels or other specials during December. Prominent were Stanier Class 5 4-6-0s, particularly No. 44888 (16F) on about December 10/11, and 44770 (6J) and 45000 (6A) on December 21. All three were appropriated by Weymouth for local duties before they returned north. No. 44888 was employed on local passenger work to Bournemouth on December 11; Nos. 45000 and 44770 were similarly employed on December 23 and were subsequently used as Weymouth pilot. No. 44770 eventually departed north with a one-coach train forming the 18.08 Weymouth–Westbury in lieu of a failed diesel multiple-unit on

stranding of a number of English-based Type 4 diesels at Perth and their consequent employment on unusual workings, including No. D341 on a Christmas day southbound Inverness–Glasgow train.

A "Britannia" Pacific No. 70035 (12A), worked over unfamiliar territory when, following an earlier diesel failure and the re-arrangement of rosters, it took over an A4 turn on the 22.30 Aberdeen–Edinburgh Millerhill freight, probably the first occasion on which an engine of this class has worked throughout on this line.

The withdrawal of two more Ferryhill A4s, Nos. 60012/23, one standard Class 5 4-6-0 No. 73058, and the transfer away of two standard 2-6-0s has left Ferryhill short of

tion" Pacifics, Nos. 46225/37/8/44/50/7, have arrived at the West of Scotland Shipbreaking Co. yard at Troon for cutting up.

[For Scottish Region information we are indebted to Messrs. S. Johnson, D. W. Smith, J. Mackenzie, N. Caplan, A. G. Murdoch, K. Twycross, J. A. King, G. M. Fleming, R. A. Errington, C. C. Thornburn, I. G. Maclean and P. H. Bolton.]

Workshops

The former BR 800 h.p. diesel-electric locomotive No. 10800, which is being employed for experimental purposes by Brush Traction, has emerged from Brush works at Loughborough in green livery and

retaining its BR number, although bearing the legend "Research Locomotive".

The latest GE electric multiple-unit to be sent to Eastleigh works for overhaul on January 1 was No. 513, one of the Bishop's Stortford line four-car outer suburban units, the first occasion that a unit of this type has been reported. Outshopped from Eastleigh on the same day was Southend unit No. 107.

[For Workshops information we are indebted to Messrs. R. K. W. Godfrey, B. R. Tunnard and M. Pickering.]

NEW BOOKS

Concluded from page 103

4ft. 8½ AND ALL THAT. By W. Mills. *Ian Allan.* **10s 6d.**

This is a slender volume of some 68 pages and about the same number of cartoons, the whole constituting a sort of railway charivaria. In a series of brief chapters Mr. Mills quips at the railway scene from its earliest days, but with a gentle and kindly satire. The older reader should particularly enjoy some of the tilts at the pre-grouping companies, even if at times history is slightly bent to meet the occasion. Moreover, for those who cherished a love for the pre-grouping lines there are strong flavours of nostalgia to be savoured.

Of both text and drawings it is difficult to know which to admire the more—the quips, the fertility of imagination or the powers of observation which combine to make up the whole, all of which traits are manifest on nearly every page. Nor is this a book which will be read only once and then placed in the bookshelf: it is something into which to dip from time to time and refresh one's spirit in the aura of the palmy days of railroading. One would suggest a dose be taken after reading each new list of present-day closures as they are announced. A bedside book, if ever there was one. **J.T.**

ROUTE CONTROL SYSTEMS (LT PRACTICE) 5s.

HOLDING THE ROUTE. By W. H. Challis. 2s. 6d. *Institution of Railway Signal Engineers.*

Of the latest issues in the Institution of Railway Signal Engineers' series of 25 booklets for students of British signalling practice, the second is a companion booklet to the three already published describing the systems employed by Westinghouse, AEI-GRS and SGE in their BR installations. Study of all three affords an interesting comparison between current BR and LT practice. Although general principles are similar, LT signalling has a number of features not found on BR, particularly automatic junction setting and the use of preselection facilities on control panels. Both booklets are illustrated by equipment and circuit diagrams and specimen track layouts. **M.J.**

LETTERS

Concluded from page 67

should be constructed at Brockley and Queenstown Road, Battersea, the latter to take the place of Battersea Park (South London line platforms). The stations at Battersea, Fulham and West Brompton on the old West London Extension line should be reopened. Consideration might also be given to extending some trains to Willesden Junction and for this purpose the line re-electrified on the third rail system.

The benefits to be obtained from an extended South London line service such as I have outlined would be enormous. Interchange points with existing or future Southern Region or London Transport routes would be at Lewisham, Brockley, Peckham Rye, Brixton, Clapham North, Clapham Junction, West Brompton and possibly Shepherd's Bush if the service were extended to Willesden Junction. The cost would be minimal compared with the cost of construction of new tube railways and in this context, it is surely time that all London's rail transport, surface and underground, were treated as one. Such a rationalisation would undoubtedly do a lot to relieve the congested London Bridge lines of the Southern Region. Further help might be obtained by the oft-proposed extension of the Bakerloo Line from Elephant & Castle to New Cross, Deptford and Greenwich to link up there with Southern Region tracks to Woolwich.

Carshalton. D. W. MOUNTAIN.

motive power report

THIS list is correct to the following dates: LMR, November 28; ER, November 28; NER, December 19; ScR., November 28; SR, December 21; WR, November 29.

MOTIVE POWER DEPOT CHANGES

The following Depots have been closed: Uttoxeter (5F) as from Dec. 7; Hereford (86C); Cardiff Cathays (88M). Craven Arms now becomes a sub-depot of Pontypool Road (86G).

NEW LOCOMOTIVES

2,750 h.p. Diesel-electric Co-Co: D1632/3/4/5-5A; D1777/81/2/3/4/6/7/9-41A; **1,250 h.p. Diesel-electric Bo-Bo:** D7508/9/10/2/3/4-16A; D7511-16A, then to 16D; **900 h.p. Diesel-electric Bo-Bo:** D8609-41A; **650 h.p. Diesel-hydraulic 0-6-0:** D9521-81A.

LOCOMOTIVES REALLOCATED

London Midland Region: W/E November 7: 3782/8-2C; 6922/64-2A; 7821-2B; 9608/41-2C; 42716/27, 42828/41/69/98-10H; 42901-9G; 43952/75-10G; 43954-8B; 43964-12D; 43967-9L; 43994-8G; 44222-10G; 44421-5D; 44462, 44527/48/97-10G; 44580-2F; 44599-9L; 44689, 44802, 44911, 45106-12A; 44808-2F; 45239-9K; 45272/83, 45422-2E; 45426-1H; 45493-2F; 45512, 46115-12A; 46440, 46503-8C; 48137-15E; 48163, 48221, 48355, 48401/90, 48701/4 48-9G; 48164, 48224-9J; 48205-9K; 48220, 48475-2B; 48382-15C; 48388, 48607-15E; 48611/23/47/8/68, 48727/71-8H; 48718-2E; 48719/52-2F; 70022/9/32/48/9-12B; 73019/28/96, 73163/5, 76022-2B; 77011/4-8E; 90123, 90541, 90725-10F; 90261-10H; 92002-2A; 92025/7-8C; 92118-2A; 92224-2D; D119-15B; D120/1/4/5/7/8/9-14B; 12089/90-1A.

W/E November 14: 2210-2D; 41232/72-6G; 42161-16C; 42435-9H; 42587-8F; 42969-5B; 43049-12A; 44544-9D; 44708/35, 44895, 45017, 45150/82, 45233, 45316/52-9E; 44743/53-8C; 44767, 45135, 45337-12A; 45104, 45381-9M; 47273-5D; 48176/8-9G; 48318-9D; 48762-2C; D7578-16C.

W/E November 21: 1628-6C; 42426, 42554-9K; 42946-2K; 44425-9E; 44580-2E; 44861-16C; 44935, 45041, 45109/29-8B; 45210-10F; 46165-5A; 48000-16C; 48105, 48219, 48552-15E; D11/94-16D; D13-16A; D3792-16C; D5249-15E; D7511-16D; 12060-15E.

W/E November 28: 42155, 42249, 42555-9K; 43017, 43122-1E; 43022-5D; 44063-10G; 44169, 44353-9L; 44844-1A; 45001/65, 45113, 45392, 45448-1F; 45073-9E; 45349, 45418/26/54-1A; 48122, 48345-6E; 48134, 48325, 48479, 48518, 48665-6C; 48539, 48679-9J; 75006-5D; 90152, 90268, 90626-10H; D214/7/30/3/92/7/8-1B; D299, D301/2/4/5/6/9/12-1A; D2391/2-8A; D5144/5-5A; 12010/24-9B; 12023/70/5/6/8, 12100/2-8F.

Eastern Region: W/E November 7: D2028/30/1, D3494-34E.

W/E November 14: D1532/8-41A; D1542-32A; D1555-30A; D1759-34G.

W/E November 21: D1542-32B; D1758-41A; D1761-34G; D3444-41B; D3707-41A.

W/E November 28: D1760-31B; D1763-41A; D5599-34G; D5677-41A.

North Eastern Region: W/E November 28: 43141-56B; 60124-51A; 90621-51C.

W/E December 5: 42084-LMR; 42664-56F; 77001/12-55F; 78011/2/4/24/5-LMR.

W/E December 12: 60117/29/32/48-52A; 61216-51A; 61237, 61322-56B; 62004-51C; 68023-51A.

W/E December 19: 60901-52A; 65859-51C.

Scottish Region: 4 weeks ending November 28: 42274-66E; 64569, 64606, 65914-62A; 76104/7/11-64F; 78026-67A.

Southern Region: Period ending December 21: D6528/35/45-70D.

Western Region: W/E November 29: 3866-81C; 6113-85B; 8436-82F; D2134/5/45/95-82A; D2200/19/35/8/40-85A; D3000/1/2/3, D3182/3/4/5/7-82A; D3256/7/8/9/60/1/2/3/4/5/6/7-86A; D3352-87B; D3363/4/6/97/8/9, D3400/2/4/5/7/19/20/1/2/3/4/5/6/7/8-86A; D3503/4/5/6/7/8-82A; D3527/94/5, D3603/7/47/8/9-86A; D3750/1, D3803/5/6-82A; D3807/9/23-86A; D3999, D4015/7/8/20/2/4/5/6, D4118/69-82A; 15101/2/3/4/5/6-86A.

LOCOMOTIVES WITHDRAWN

2211/21, 3217, 4120/53, 4602/87, 4954, 5026/56/89, 5153, 5699, 6137, 6364/95, 6678, 6842, 6925/33/6/94, 7012, 7207/21/6, 7806/7/24, 8739, 9642/61, 30530/41/2/3, 30823/35, 33012, 34092, 35001, 42449/89, 42565/73/86, 42654/7, 42754, 42856/80, 42925, 43908/29/54/60/3/79, 44025/7/40/79, 44131/4/49/77/8/85, 44222/9/33, 44478/81/4/97, 44575/80/9/91, 45035, 45155, 45553/4, 45617/72/99, 45703, 46148/65, 47211/30/88, 47333, 47587, 48069, 48455, 60036/45/51/84, 61165, 61212/74/94, 61382/98, 62009/61, 63456, 63663, 67620/8/46/90/1, 68050, 73058, 73116, 80044/50, 82015, 90289, 90469/88, 90567/81, 90685, 15201/2/3.

DIESEL MULTIPLE-UNITS

Withdrawn: M79076 **(W/E October 10):** M51944 **(W/E November 14).**

LOCOMOTIVES TRANSFERRED TO DEPARTMENTAL STOCK

69005/23 renumbered in E. & NE Departmental Series Nos. 58 and 59 respectively.

LOCOMOTIVE RESTORED TO TRAFFIC

9430-85B **(W/E November 22).**

LOCOMOTIVES NAMED

D53 Royal Tank Regiment: D60 Lytham St. Annes: D62 5th Royal Iniskilling Dragoon Guards: D70 Royal Marines.

AMENDMENTS

January Issue: North Eastern Region W/E November 21: 63343-51C should read 63443-51C; **Southern Region period ending November 16:** delete D3469-73C; **Locomotives Withdrawn:** 76073 should read 76072.

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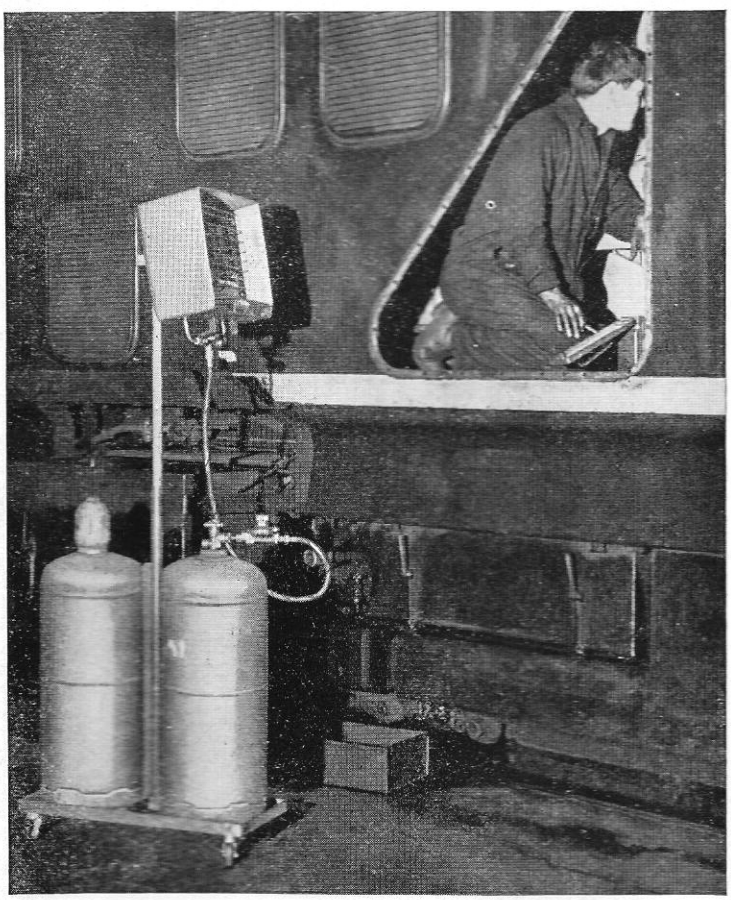

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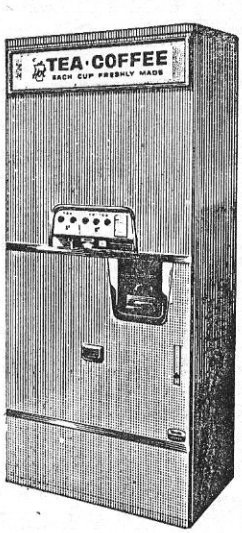

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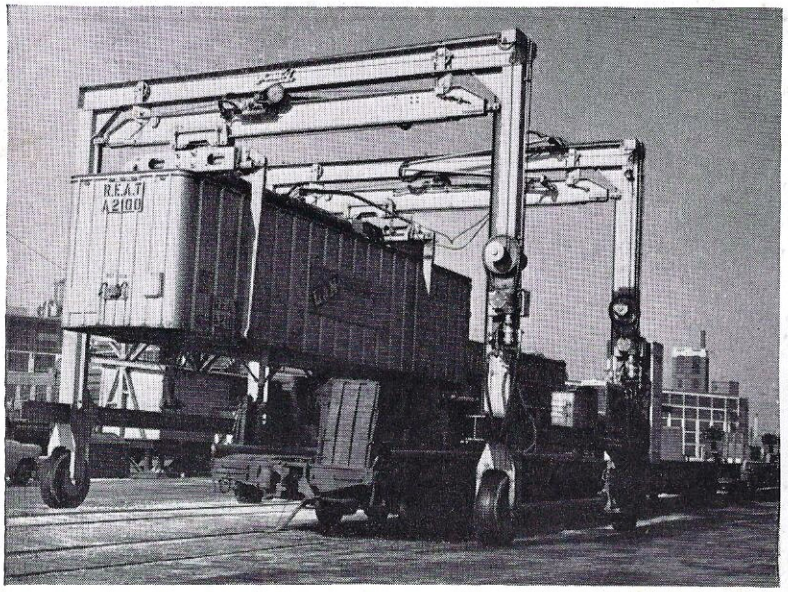

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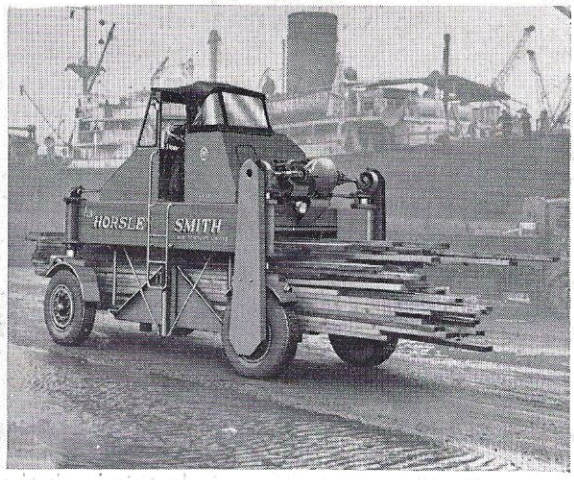

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